

CITY DESIGN & CONSTRUCTION STANDARDS



MAYOR: BOBBY BURNS

COUNCIL MEMBERS

1 – PAT SCHNEIDER

2 – JULUIS L. BROOKS, SR.

3 – JAMES D. WEBB

4 – BERRY D. SIMPSON

JOSE CUEVAS, JR. – AT LARGE

DALE A. BROWN – AT LARGE

CITY MANAGER: MIKE MCGREGOR

ASSIST. CITY MANAGER: RICK MENCHACA

ASSIST. CITY MANAGER: GLEN HACKLER

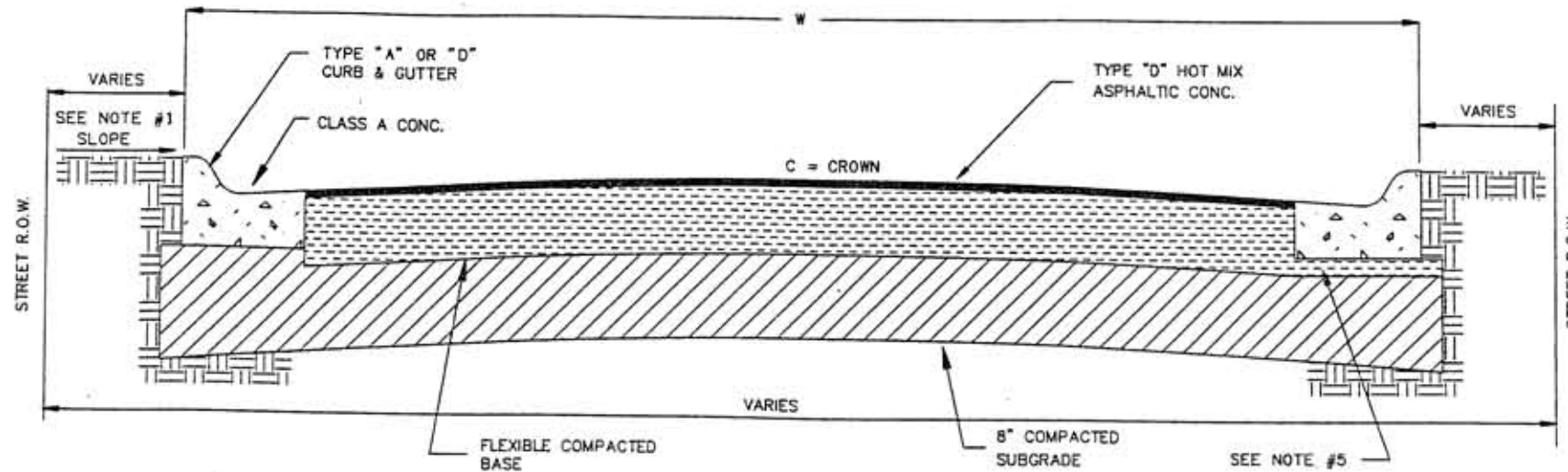
ENGINEERING AND DEVELOPMENT DEPARTMENT

DIRECTOR
HARVEY HANSEN

CITY OF MIDLAND
300 N. LORAIN ST.
TEXAS, 79702

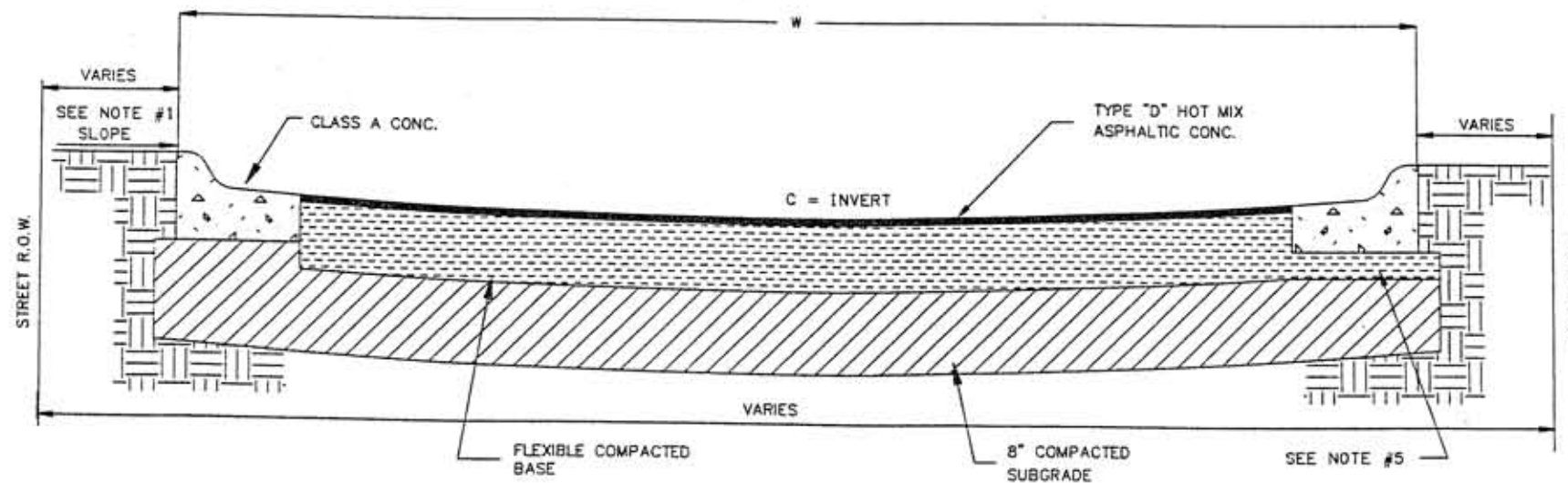
CITY ENGINEER
JAMES P. ROBERTSON

PREPARED BY: DESIGN and CONSTRUCTION DIVISION NOVEMBER 1, 1995



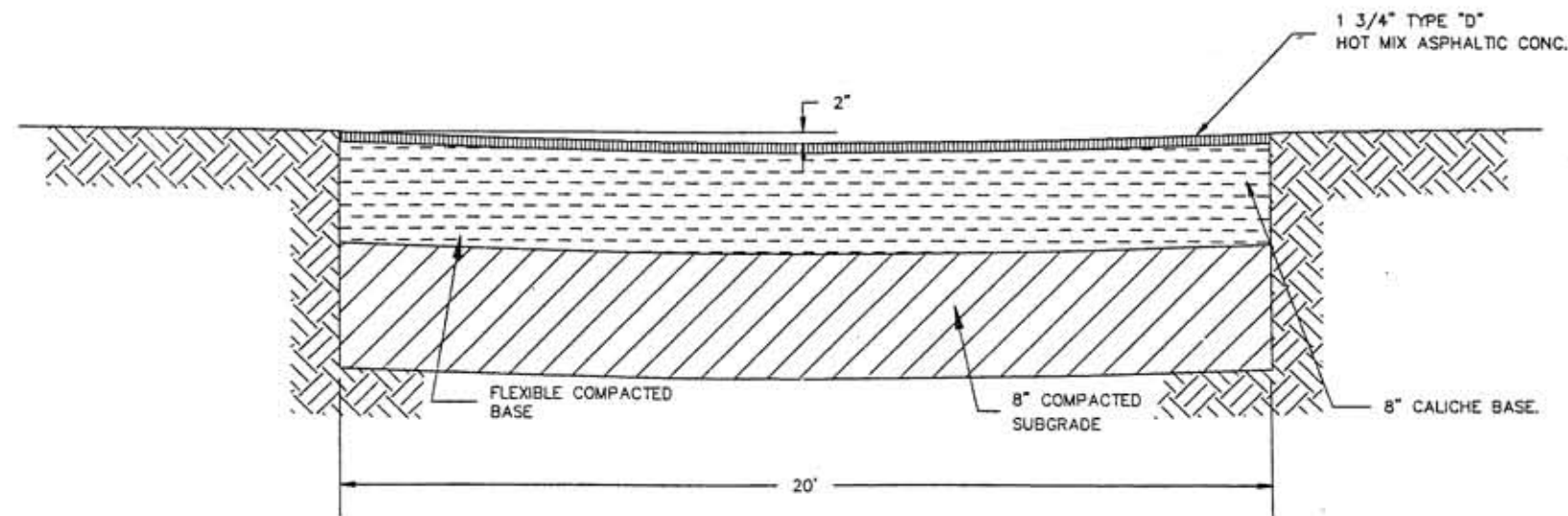
WHERE	W =	C =	ASPHALT THICKNESS	BASE THICKNESS
•	31'	4"	1 3/4"	8"
•	37'	4 1/2"	1 3/4"	8"
•	41'	5"	1 3/4"	8"
•	46'	5 1/2"	1 3/4"	8"
•	51'	6"	3"	10"
•	56'	6 1/2"	3"	10"
•	61'	7"	3"	10"
•	65'	8"	3 1/2"	12"
•	68'	8"	3 1/2"	12"
•	72'	8 1/2"		
•	76'	9"		
•	81'	10"		
•	86'	10 1/2"		

SEE PLAN AND PROFILE SHEETS AND BID PROPOSAL FOR ASPHALT AND BASE THICKNESS FOR THESE STREETS.

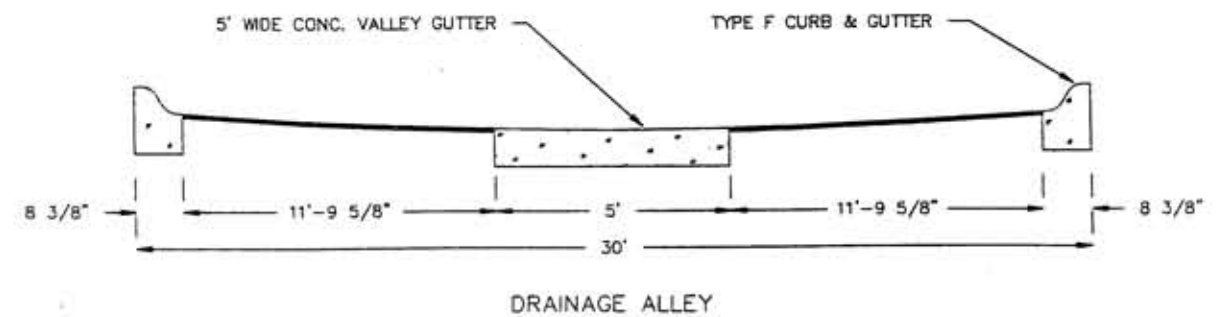



1. THE MAXIMUM SLOPE OF 1/4" /FT. SHALL BE MEASURED FROM THE TOP OF CURB AND SHALL APPLY TO THE FULL WIDTH OF THE AREA BETWEEN THE BACK OF CURB AND THE PROPERTY LINE (R.O.W. LINE).
2. CONCRETE SHALL BE CITY OF MIDLAND CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P.S.I.
3. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE CITY OF MIDLAND STANDARD SPECIFICATIONS.
4. COMPACTED SUBGRADE SHALL EXTEND 6" BEYOND BACK OF CURB.
5. WHEN THE DEPTH OF CALICHE BASE IS 3" OR MORE BELOW THE BOTTOM OF THE CONCRETE CURB, EXTEND THE FIRST BASE COURSE TO 6" BEYOND THE BACK OF CURB.
6. IF THE PLANS OR THE SPECIFICATIONS REQUIRE A DIFFERENT STREET SECTION (PAVING, BASE, OR OTHERWISE) THEN THESE STANDARDS, THE PLANS AND SPECIFICATIONS WILL GOVERN.
7. THE FORMULA FOR MINIMUM STREET CROWN IS $(\frac{W}{100})^{1/2} = C$ ADJUSTED TO THE NEAREST 1/2" WHERE W IS THE STREET WIDTH FROM BACK OF CURB TO BACK OF CURB, C IS THE CROWN HEIGHT ABOVE THE LIP OF THE GUTTER SECTION.
8. INVERTED CROWNS ARE THE INVERSE OF THE STANDARD CROWN AND ARE COMPUTED IN THE SAME MANNER.

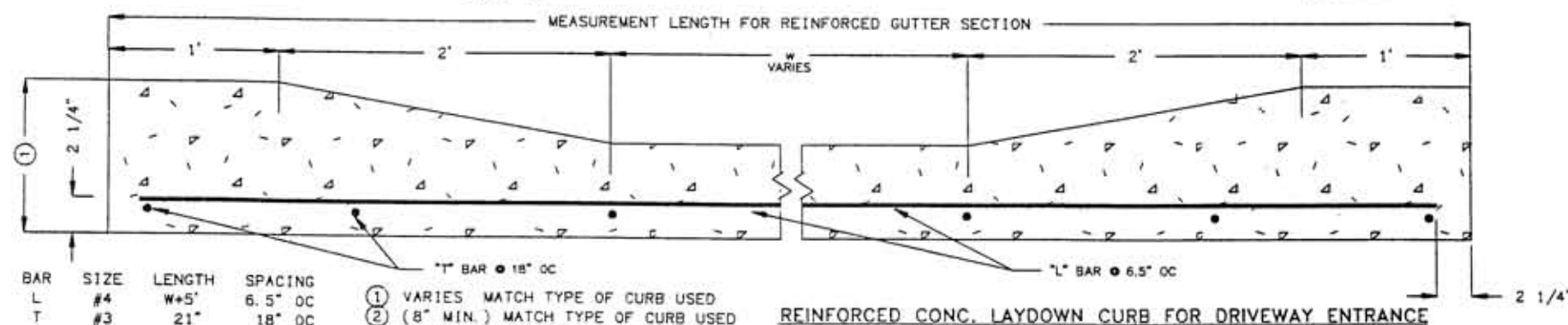
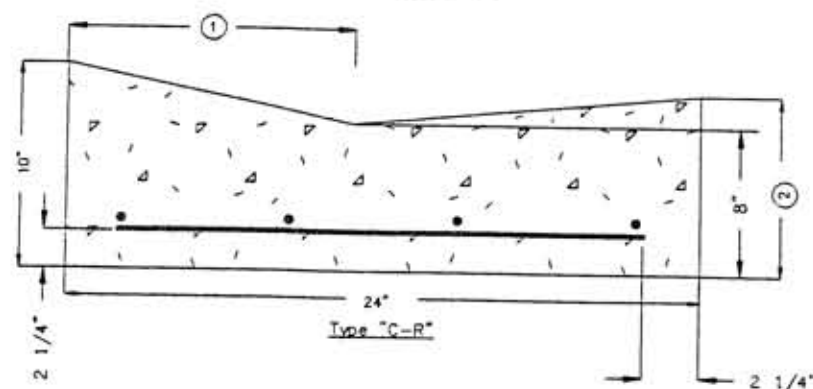
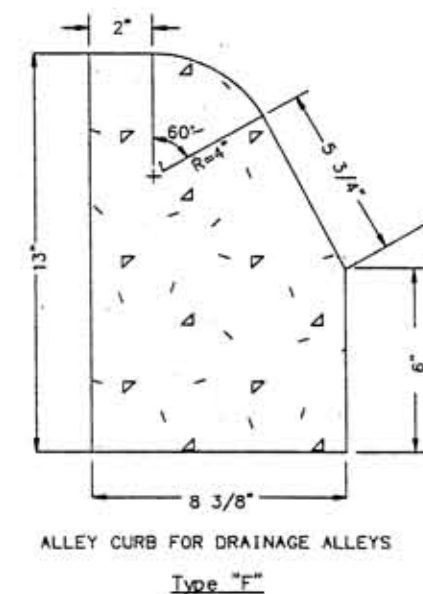
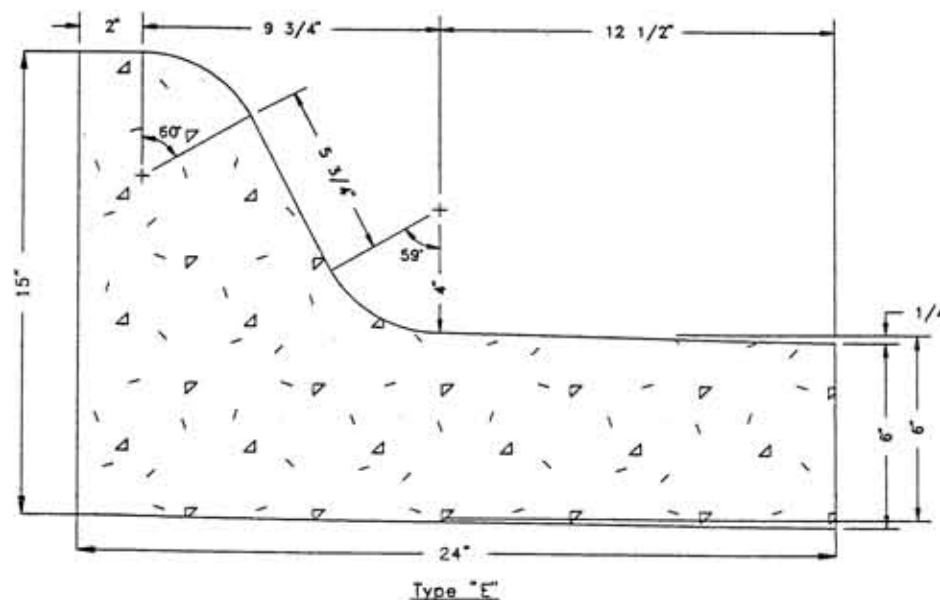
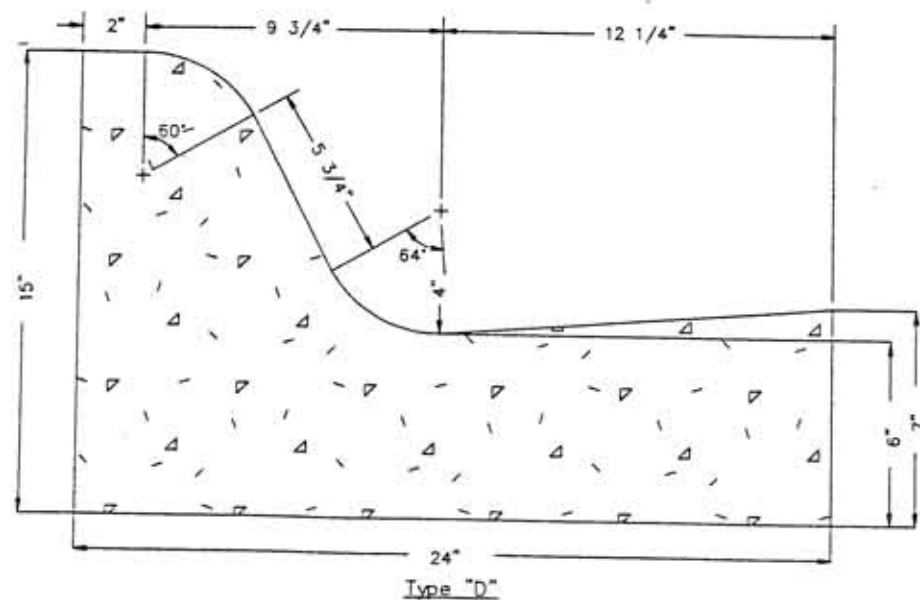
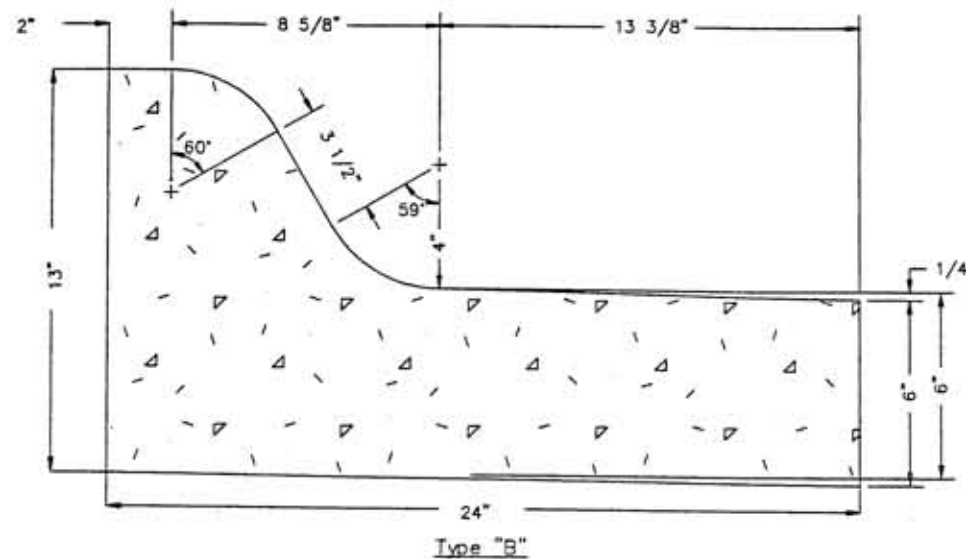
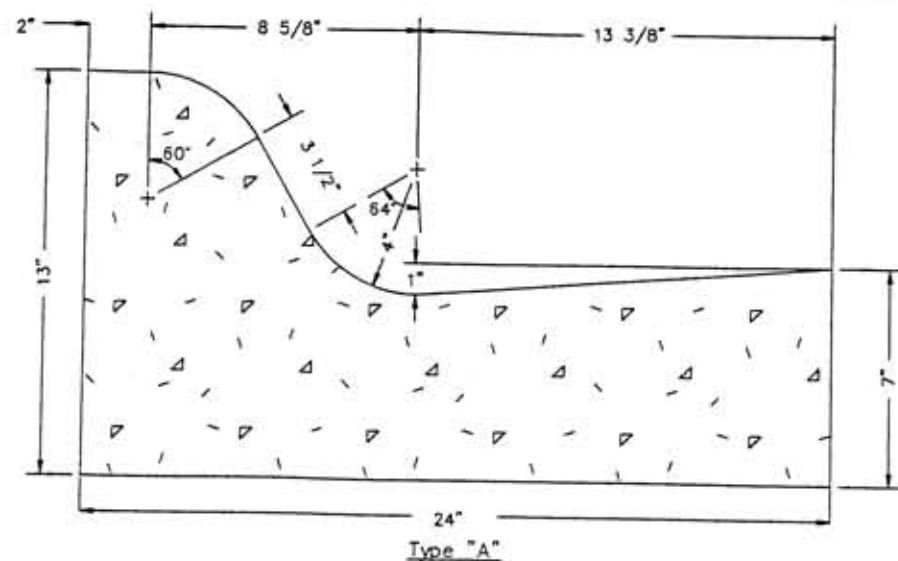
3					CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION CITY DESIGN & CONSTRUCTION STANDARDS STREET SECTION	INDEX	ST_SEC	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	P-1



1. CONCRETE SHALL BE CITY OF MIDLAND CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P.S.I.
2. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE CITY OF MIDLAND STANDARD SPECIFICATIONS.
3. THE MINIMUM DEPTH FOR ANY UTILITY LINE OR SERVICE LINE PLACED IN AN ALLEY AHEAD OF PAVING SHALL BE 30" BELOW FINISHED CENTER LINE GRADE.



3					<p>CITY OF MIDLAND</p> <p>DESIGN AND CONSTRUCTION DIVISION</p> <p>CITY DESIGN & CONSTRUCTION STANDARDS</p> <p>ALLEY SECTION</p>	INDEX	ALLEY_SEC	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	P-2



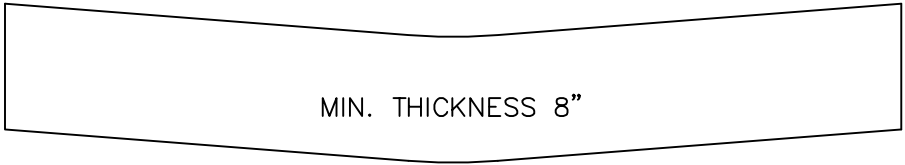
1. CONCRETE SHALL BE CITY OF MIDLAND CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P. S. I.
2. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE CITY OF MIDLAND STANDARD SPECIFICATIONS.
3. USE TYPE "C-R" CURB WHEN LAY-DOWN CURB IS CALLED FOR ON THE SECTION TO BE PLACED MONOLITHIC WITH DRIVEWAY, ALLEY RETURN.

3			
2			
1			
REV. NO.	DATE	BY	DESCRIPTION

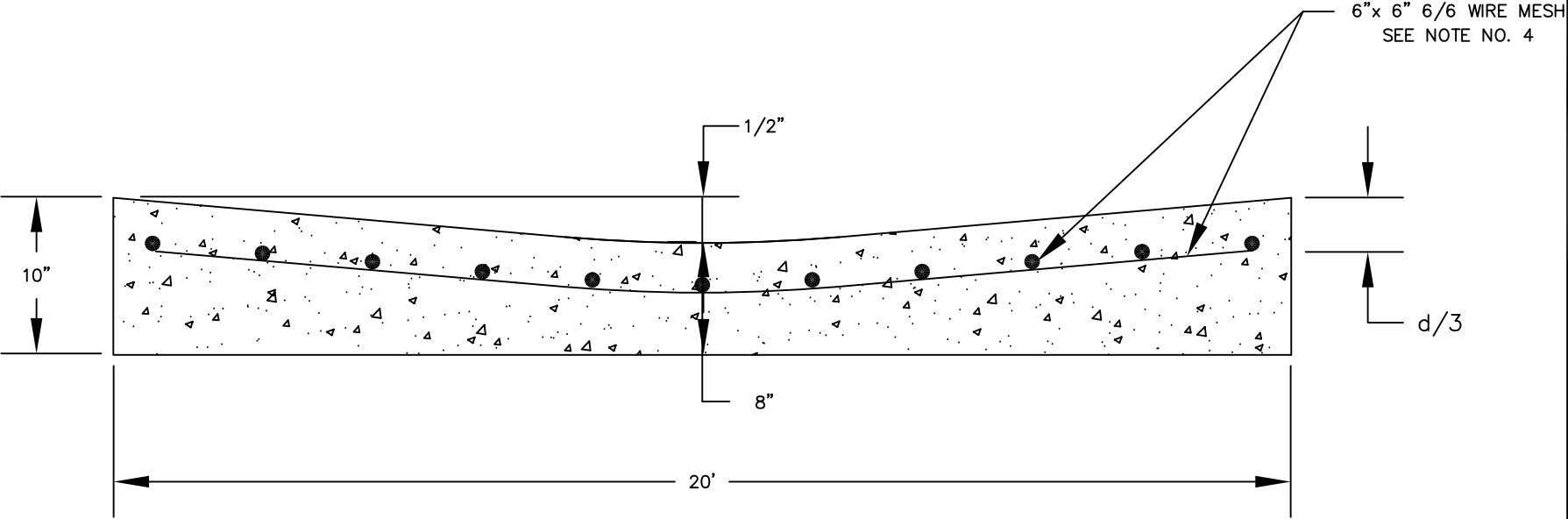


CITY OF MIDLAND
DESIGN AND CONSTRUCTION DIVISION
CITY DESIGN & CONSTRUCTION STANDARDS
CURB & GUTTER DETAILS

INDEX	CURB_GUT	SCALE	N.T.S.
DRAWN	A.R.Karch	DATE:	Nov. 1, 1994
CHECKED	B.R.G.	DWG. NO.	P-3
APPROVED	J.P.R.		

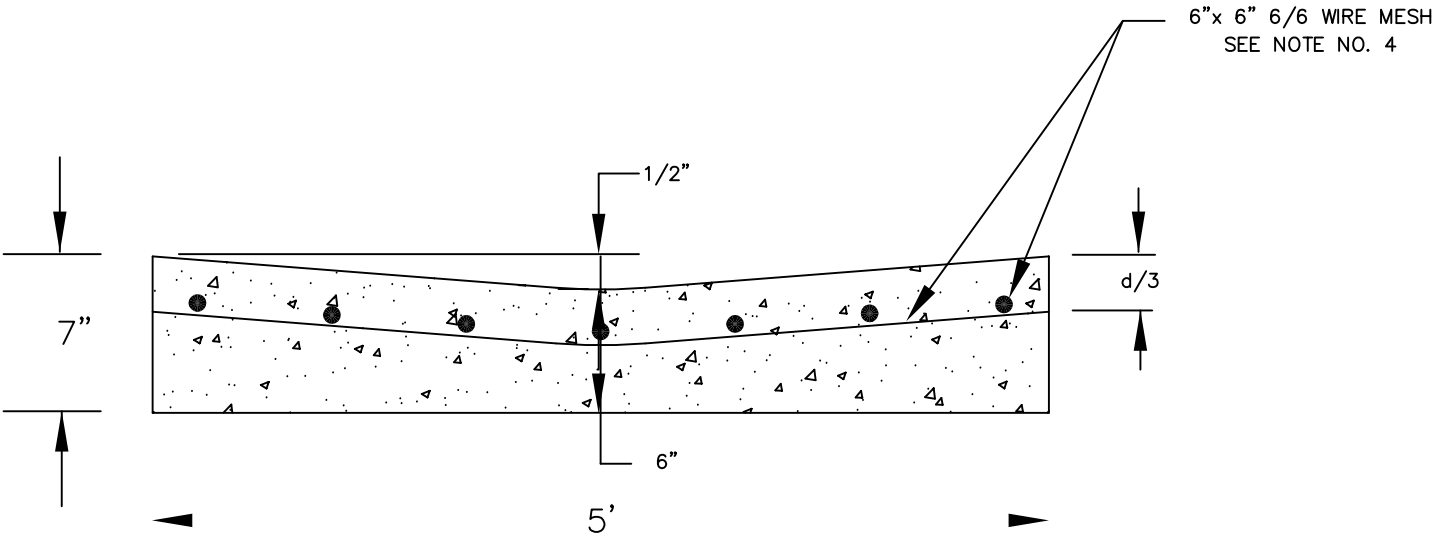


ALTERNATE SHAPE




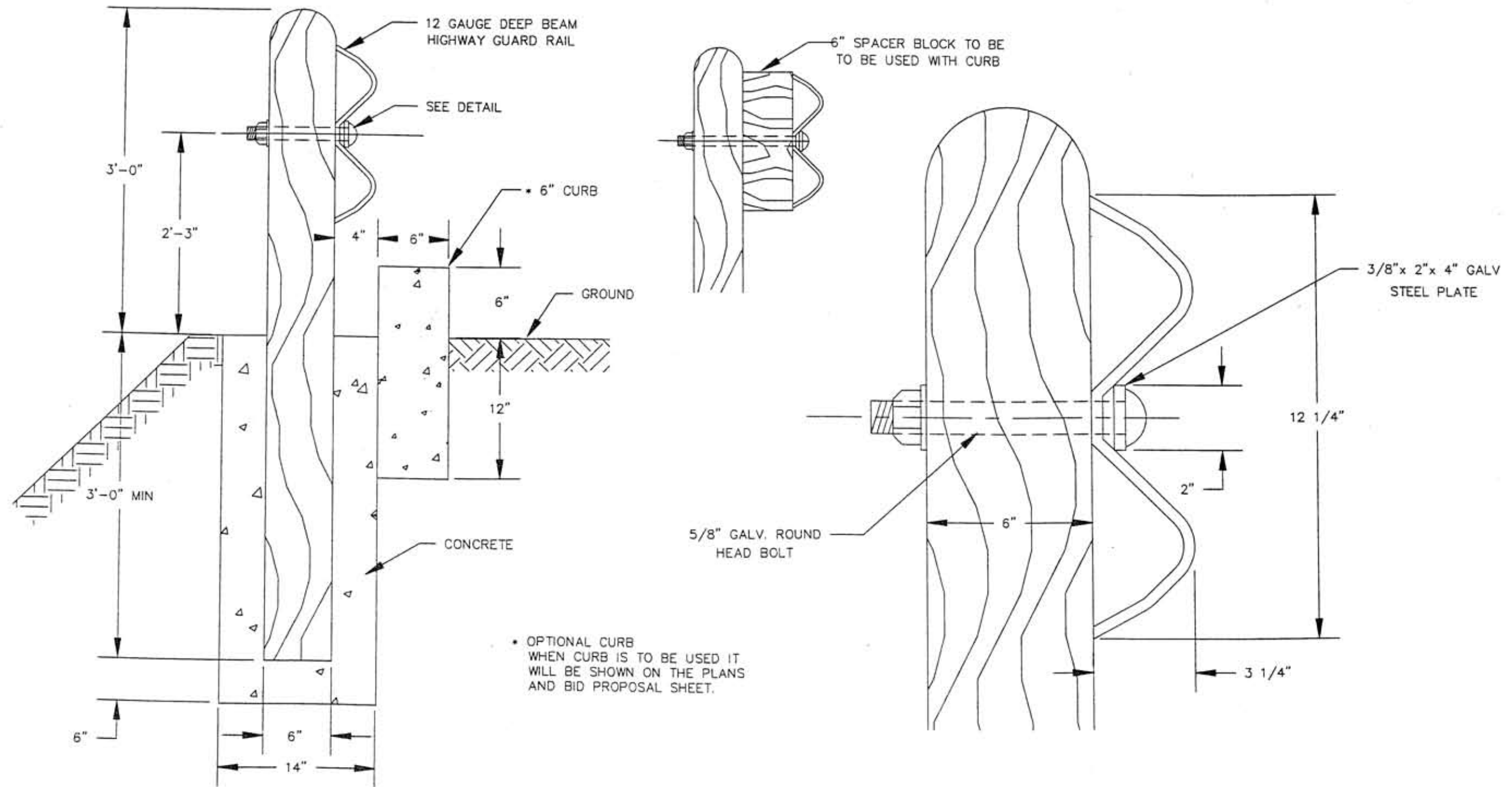
HIGH TRAFFIC ARTERIAL STREET

1. CONCRETE SHALL BE CITY OF MIDLAND CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P.S.I.
2. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE CITY OF MIDLAND STANDARD SPECIFICATIONS.
3. ALL WIRE REINFORCING SIZES ARE GAGE.
4. THE CONTRACTOR MAY AT HIS OPTION USE FIBERMESH OR CAPROLAN-RC OR APPROVED EQUAL IN LIEU OF 6" x 6" 6/6 GAGE WIRE MESH REINFORCING.

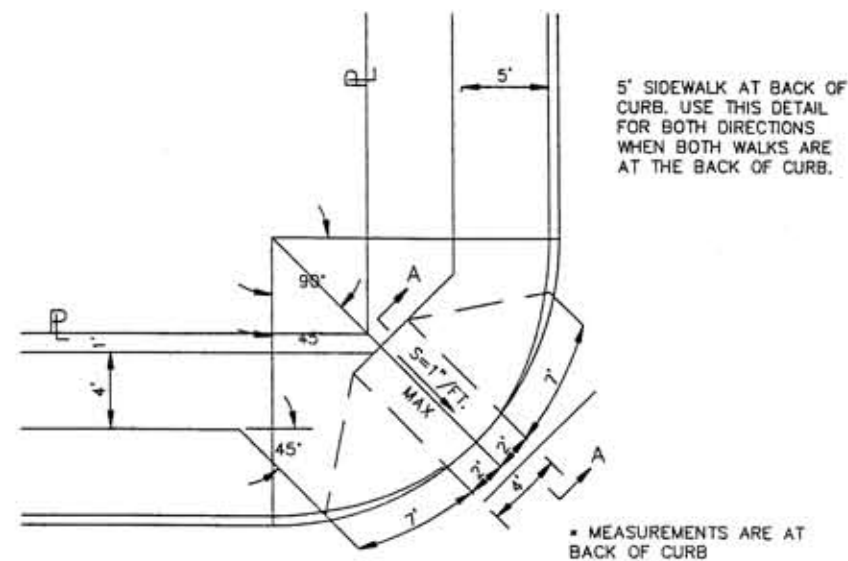


COLLECTOR AND RESIDENTIAL STREETS

					Engineering Services Division Development Services Department City Design and Construction Standards Concrete Center Invert For Streets	Dwg. Name	inv_sect07	Dwg. No.	P-4
						Drawn By	V.M. Lowe		
						Checked By	R. Franks	Date	October 2007
Rev. No.	Date	By	Description			Approved By	J.P. Robertson	Scale	N.T.S.

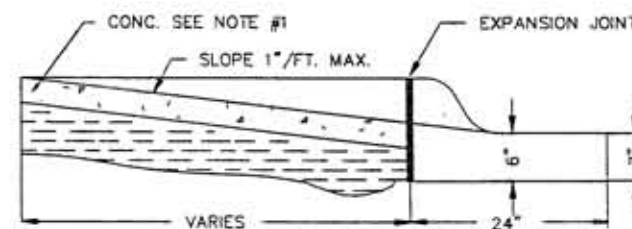


3					<p>CITY OF MIDLAND</p> <p>DESIGN AND CONSTRUCTION DIVISION</p> <p>CITY DESIGN & CONSTRUCTION STANDARDS</p> <p>WOOD POST WITH GUARD RAIL</p>	INDEX	WP_GUARD	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	P-5

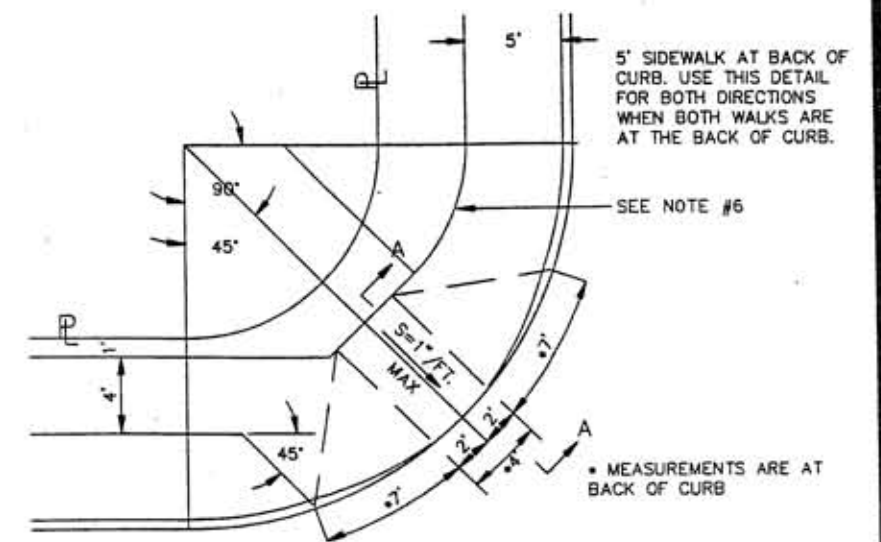


4' SIDEWALK 1' OFF PROPERTY LINE
USE THIS DETAIL FOR BOTH DIRECTIONS
WHEN BOTH WALKS ARE 1' OFF
PROPERTY LINE.

STANDARD HANDICAP RAMP
15' CURB RADIUS



HANDICAP RAMP
SECTION A-A



4' SIDEWALK 1' OFF PROPERTY LINE
USE THIS DETAIL FOR BOTH DIRECTIONS
WHEN BOTH WALKS ARE 1' OFF
PROPERTY LINE.

STANDARD HANDICAP RAMP
20' CURB RADIUS

1. CONCRETE SHALL BE CITY OF MIDLAND CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P.S.I.
2. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO CITY OF MIDLAND STANDARD SPECIFICATIONS
3. ALL SIDEWALKS AND RAMPS SHALL HAVE COARSE BROOM FINISH OR OTHER ROUGH NON-SKID TYPE FINISH AS APPROVED BY THE ENGINEER.
4. THE STANDARD LOCATION FOR HANDICAP RAMPS IS THE CENTER OF THE CURB RETURN RADIUS.
5. STREET RADII SHOWN ARE THE MOST COMMONLY USED. FOR OTHER RADII HANDICAP RAMPS WILL BE OF SIMILAR CONSTRUCTION. IN NO CASE SHALL THE RAMP SLOPE BE GREATER THAN 1"/FT. IN ANY DIRECTION.
6. FOLLOW RADIUS CURVATURE OF BACK OF CURB FOR BACK EDGE OF THE SIDEWALK SO THAT THE MINIMUM WIDTH FOR SIDEWALK AT ANY POINT IS 5' WIDE.

CONDITION 2 & 3

- (2) BOTH WALKS AT BACK OF CURB
- (3) ONE WALK AT BACK OF CURB & ONE WALK AT 1' OFF PROPERTY LINE

CONDITION 4

ONE SIDEWALK AT BACK OF CURB

CONDITION 1

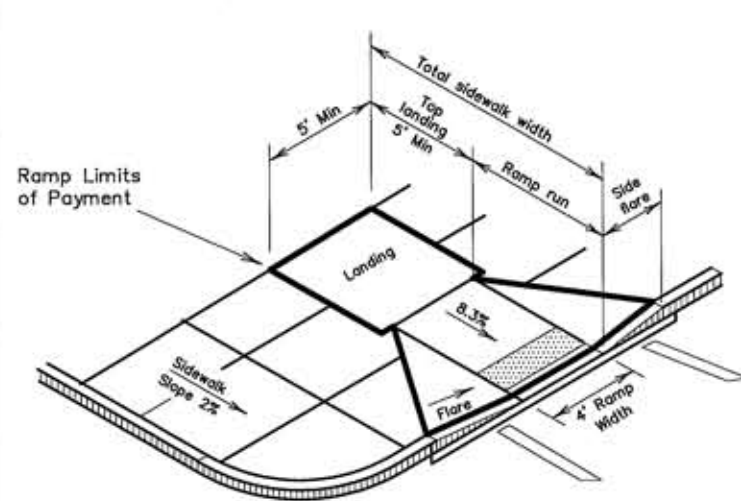
TWO SIDEWALKS AT BACK OF CURB

CONDITION 5

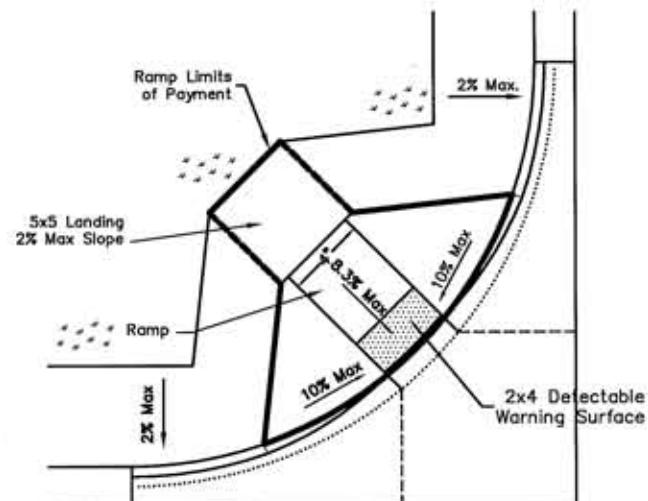
ONE SIDEWALK AT 1' OFF PROPERTY LINE

CONFIGURATION MAY VARY SLIGHTLY
DUE TO SITE CONDITIONS

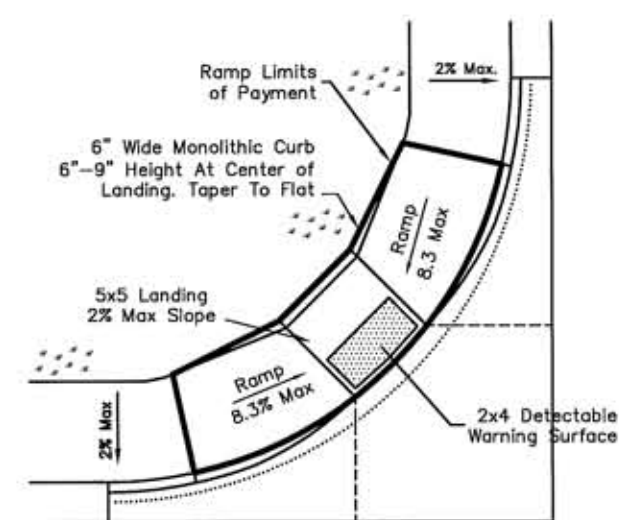
3					CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION CITY DESIGN & CONSTRUCTION STANDARDS HANDICAP RAMP	INDEX	HANDI_RAMP	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	R.B.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	P-6



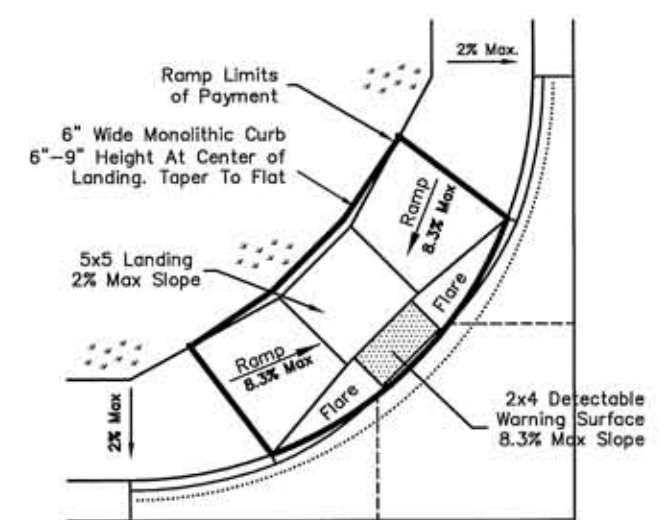
Type 1: Perpendicular Curb Ramp



Type 8: Diagonal Curb Ramp



Type 12: Diagonal Curb Ramp
For Narrow or Obstructed ROW
Ramp To Be Used Only after
Permission From City Engineering
Department Has Been Given
685-7286



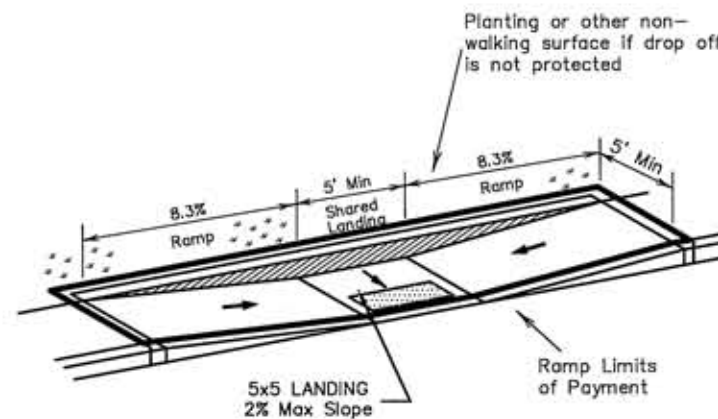
Type 4: Diagonal Combination Curb Ramp

CURB RAMP NOTES:

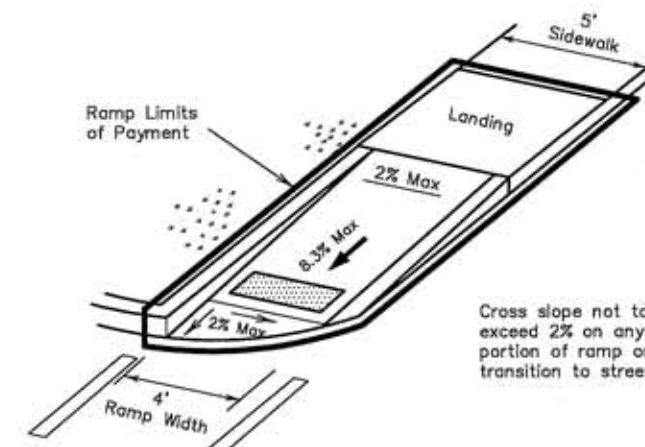
1. All slopes are maximum allowable. The least possible slope that will still drain properly should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
2. Landings shall be 5'x 5' minimum with a maximum 2% slope in any direction.
3. Maneuvering space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
4. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
5. Curb ramps with returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planting or other non-walking surface or because the side approach is substantially obstructed. Otherwise, provide flared sides.
6. Additional information on curb ramp location, design, light reflective value and texture may be found in the current edition of the Texas Accessibility Standards (TAS) and 16 TAC 68.102.
7. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall be aligned with theoretical crosswalks, or as directed by the Engineer.
8. Provide a smooth transition where the curb ramps connect to the street.
9. Flare slope shall not exceed 10% measured along curb line
10. Adjust curb ramp location and or type so that no obstruction is located within the landing area.

SIDEWALK NOTES:


1. Where obstructions in sidewalk exist, there shall be a 3' minimum clearance. Sidewalk location may be shifted with the approval from engineering division.
2. The minimum sidewalk width is 5' where the sidewalk is adjacent to the back of curb on all new construction except on arterials (highways and 5 lane streets). Sidewalks on arterials shall be 4' wide at 1' off property line.
3. All sidewalks and ramp with a concrete surface shall have a coarse broom finish or other rough non-skid type finish as approved by the engineering division.

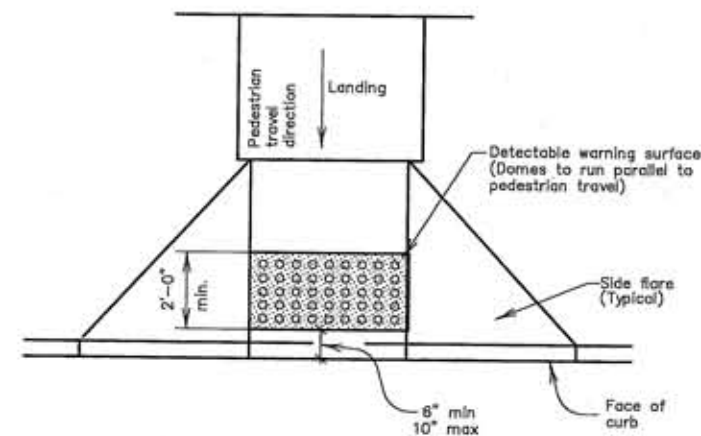


Type 2: Parallel Curb Ramp

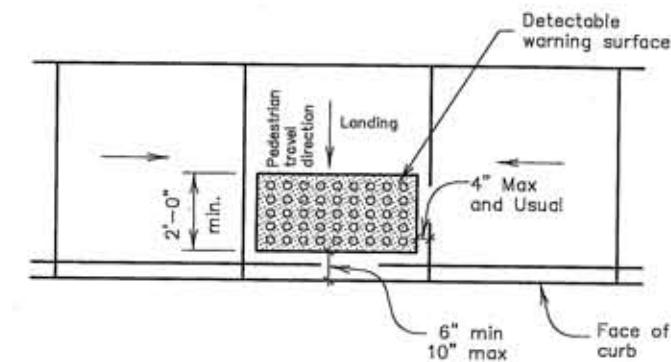


Type 10: Directional Ramp Within Radius

Rev. No.	Date	By	Description		<p>Engineering Services Division Development Services Department City Design and Construction Standards Pedestrian Curb Ramps</p>	<p>Dwg. Name CurbRamp09 Drawn By V.M. Lowe Checked By A.R.Karch Approved By R.Franks</p>	<p>Dwg. No. P-6a Date February, 2009 Scale N.T.S.</p>
----------	------	----	-------------	---	---	--	---

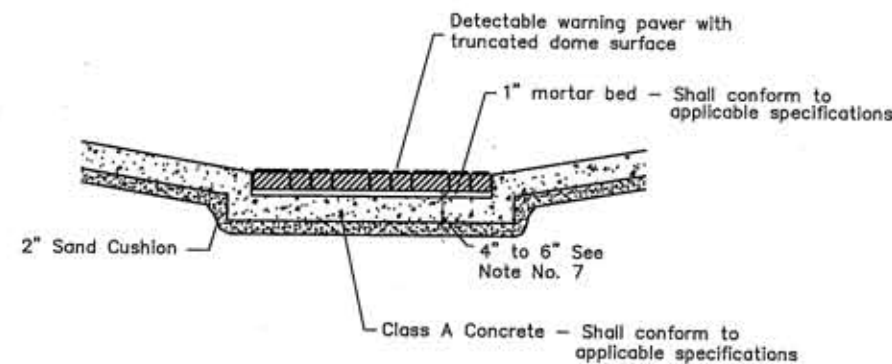


Typical placement of detectable warning surface on sloping ramp run.



Typical placement of detectable warning surface on landing at street edge.

1. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with Section 4.29 of the Texas Accessibility Standards (TAS). The surface must contrast visually with adjoining surfaces, including side flares. Furnish dark brown or dark red detectable warning surface adjacent to uncolored concrete, unless specified elsewhere in the plans.
2. Detectable warning surfaces must be slip resistant and not allow water to accumulate.
3. Align truncated domes in the direction of pedestrian travel when entering the street.
4. Shaded areas on Sheet 6a indicate the approximate location for the detectable warning surface for each curb ramp type.
5. Detectable warning surfaces shall be a minimum of 24" in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
6. Detectable warning surfaces shall be located so that the edge nearest the curb line is a minimum of 6" and a maximum of 10" from the extension of the face of curb. Detectable warning surfaces may be curved along the corner radius.
7. Place 6" of concrete in ramps, landings, and flares that are located at the returns adjacent to the back of curb of arterial streets and commercial sites.



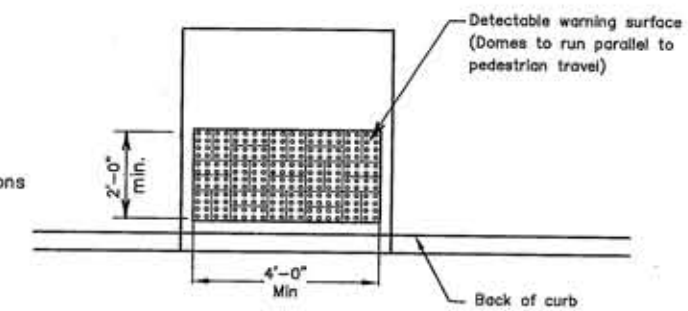
SECTION THROUGH PAVERS

PAVER NOTES:

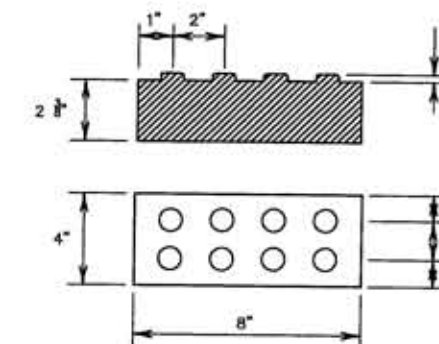
Detectable warning pavers may vary in size as shown. Units must meet all requirements of ASTM C-936, C-33. Lay in a two unit basket weave pattern or as directed.

Lay full-size units first followed by closure units consisting of at least 25 percent of a full unit. Cut detectable warning paver units using a power saw.


The contractor at his option may use an alternative detectable warning surface such as Armor-Tile ADA Sound Amplifying Detectable/Tactile Warning Surface Tile or equal and approved by the engineer as meeting all requirements of ASTM C-936, C-33.



Truncated Dome Pattern

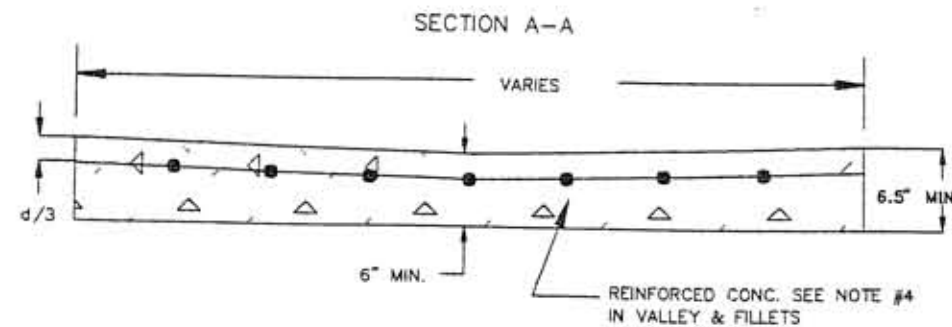
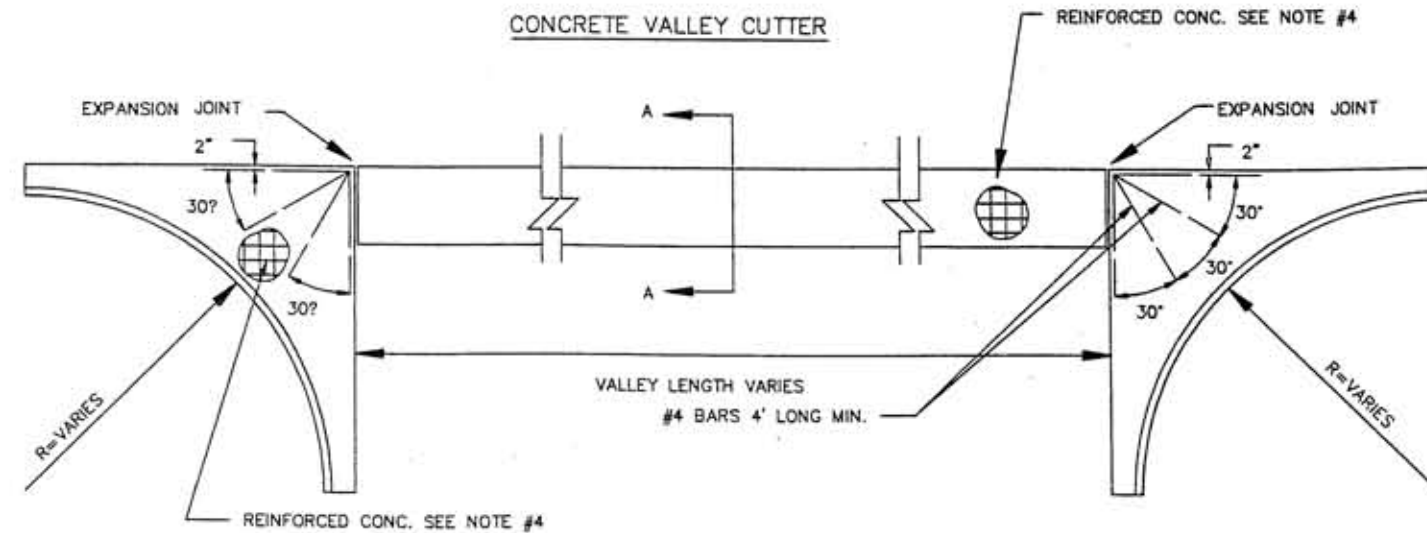


Detectable Warning Paver

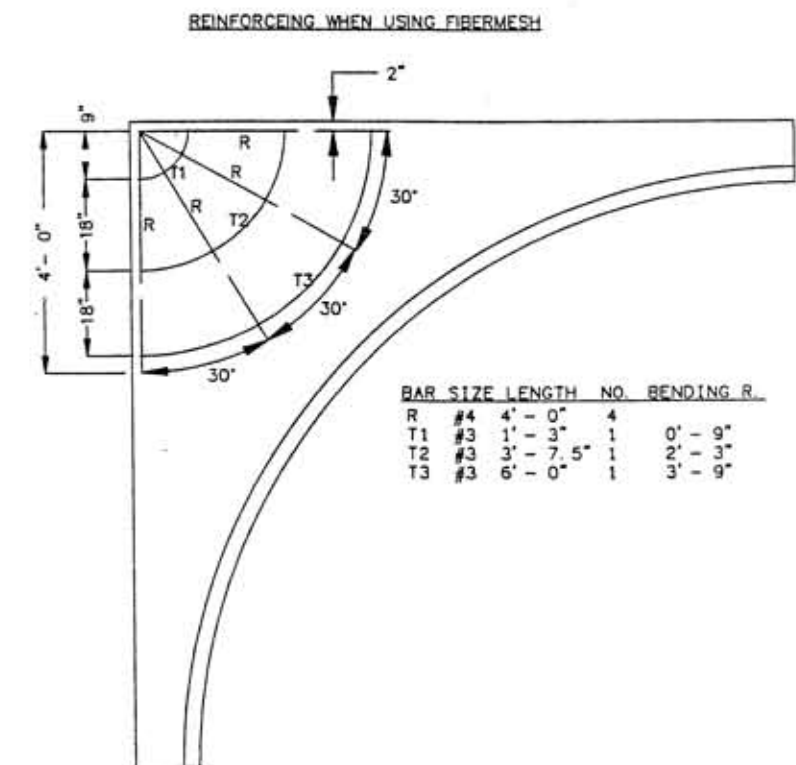
					<p>Engineering Services Division Development Services Department City Design and Construction Standards Detectable Warnings</p>	Dwg. Name CurbRamp09	Dwg. No. P-6b
						Drawn By V.M. Lowe	
						Checked By A.R.Karch	Date February, 2009
Rev. No.	Date	By	Description			Approved By R.Franks	Scale N.T.S.

BACK OF CURB R.	FILLET AREAS (90°)			CURB LENGTH L.F.
	COMPUTING R.	AREA S.F.	AREA S.Y.	
8	10	21.46	2.38	12.56
12	14	42.06	4.67	18.85
15	17	62.01	6.89	23.56
18	20	85.84	9.54	28.27
20	22	103.86	11.54	31.42
25	27	156.44	17.38	39.27
30	32	219.75	24.42	47.12
35	37	293.79	32.64	54.98
40	42	378.56	42.06	62.83
45	47	474.06	52.67	70.69
50	52	580.28	64.48	78.54


VALLEY GUTTER	WIDTHS	THICKNESS	
		C.L.	EDGE
RESIDENTIAL ST.	5'	6"	6.5"
MINOR COLLECTOR	5'	6"	6.5"
MAJOR COLLECTOR	10'	6"	7.0"
MINOR ARTERIAL	20'	7"	8.0"
MAJOR ARTERIAL	SEE PLANS		

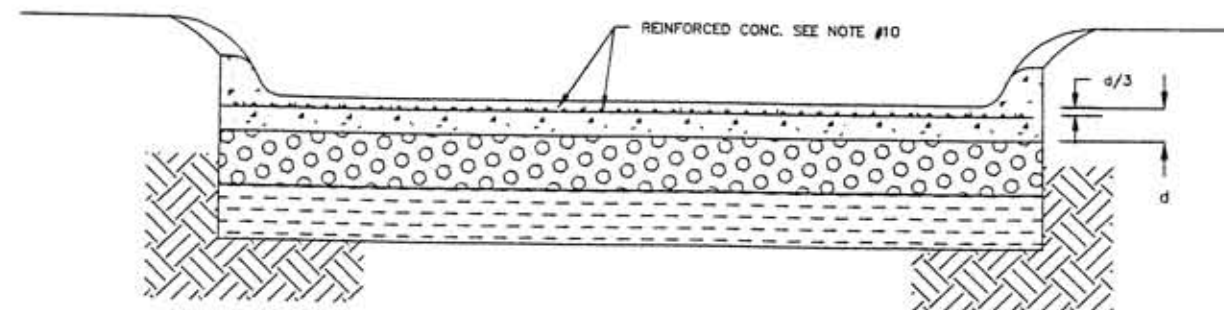
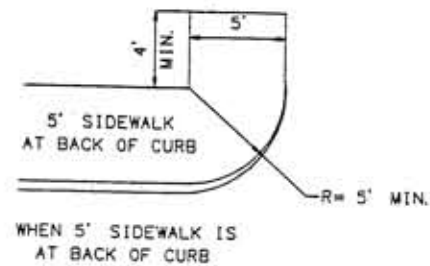
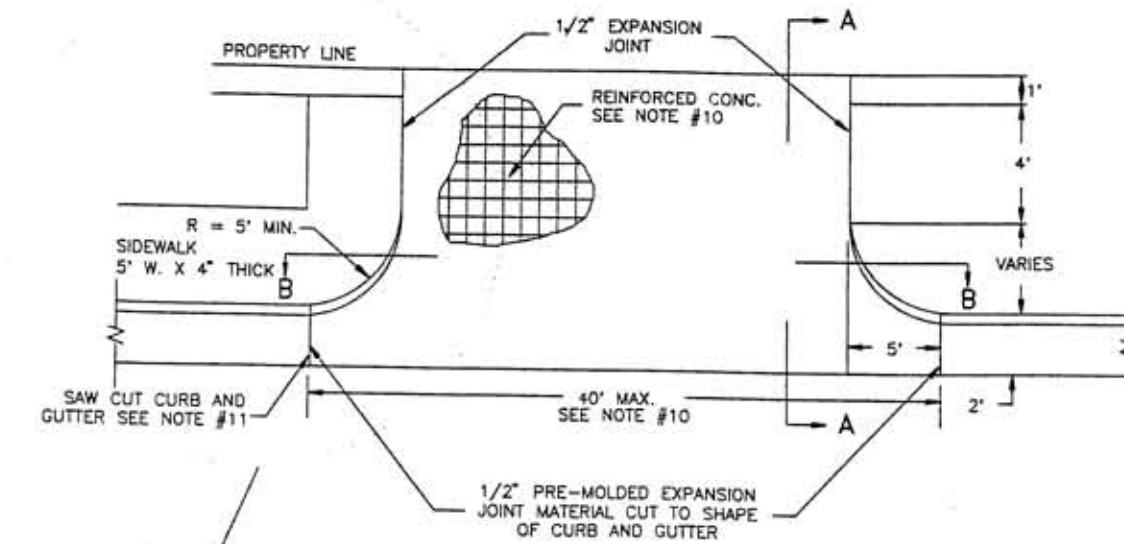


1. CONCRETE SHALL BE CITY OF MIDLAND CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P. S. I.
2. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO CITY OF MIDLAND STANDARD SPECIFICATIONS.
3. ALL WIRE REINFORCING SIZES ARE GAGE.
4. THE CONTRACTOR MAY AT HIS OPTION USE FIBERMESH OR CAPROLAN-RC OR APPROVED EQUAL IN LIEU OF 6" x 6" 6/6 GAGE WIRE MESH REINFORCING.
5. FOR THICKNESS SEE VALLEY GUTTER TABLE THIS SHEET.
6. WHEN FILLET AREA IS TO BE PAVED WITH 8" THICK CONCRETE THE BOTTOM OF THE CURB AND GUTTER WILL BE EXTENDED TO MATCH THE FILLET THICKNESS.
7. CONCRETE FILLET AREA SHALL BE PLACED MONOLITHIC WITH CURB.
8. ALL REINFORCING STEEL SHALL BE PLACED AT THE UPPER 1/3 POINT OF SLAB CONCRETE ON GRADE AND SHALL HAVE A MINIMUM COVER OF 2".

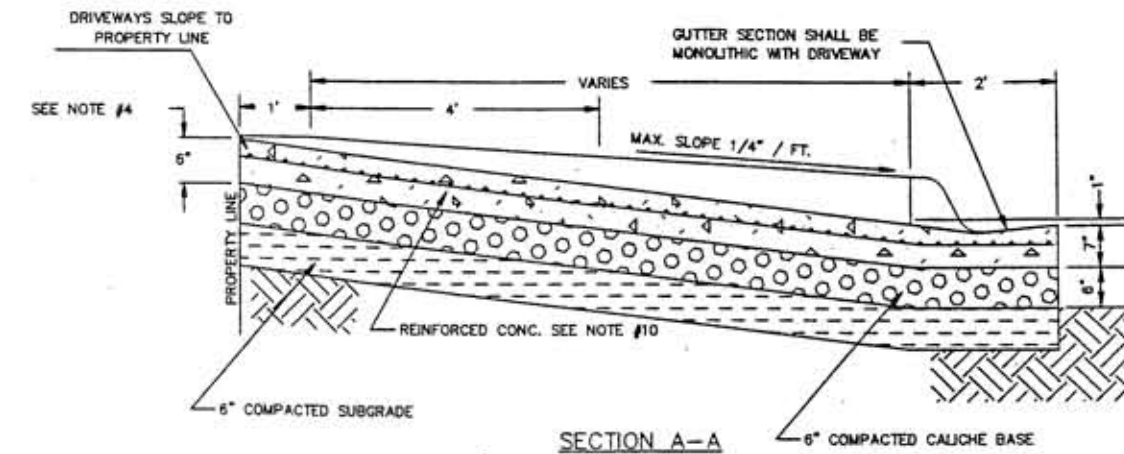


BAR SIZE	LENGTH	NO.	BENDING R.
R #4	4' - 0"	4	0' - 9"
T1 #3	1' - 3"	1	2' - 3"
T2 #3	3' - 7.5"	1	3' - 9"
T3 #3	6' - 0"	1	

3					CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION	INDEX	VAL_GUT_FIL	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION		CITY DESIGN & CONSTRUCTION STANDARDS VALLEY GUTTER & FILLETS	APPROVED	J.P.R.	DWG. NO.	P-7

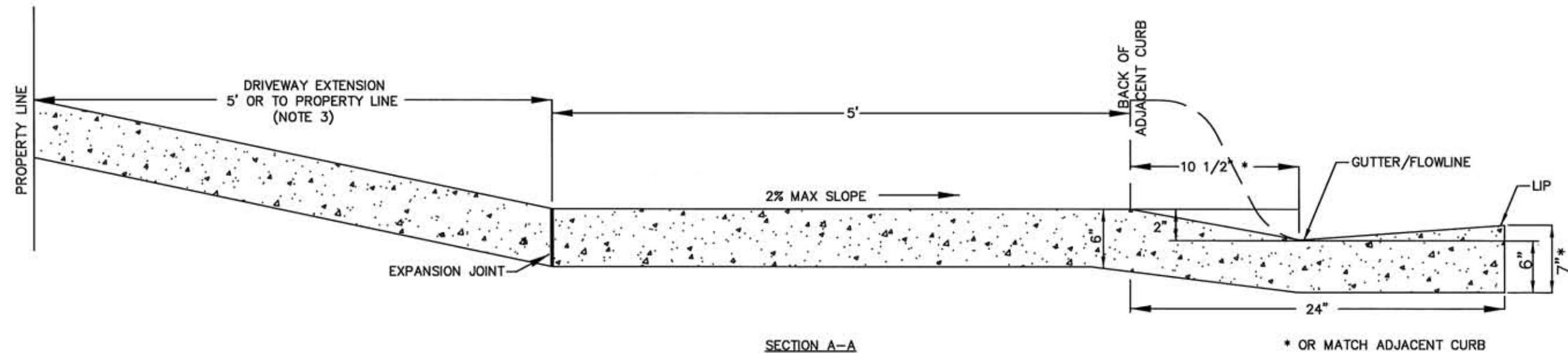
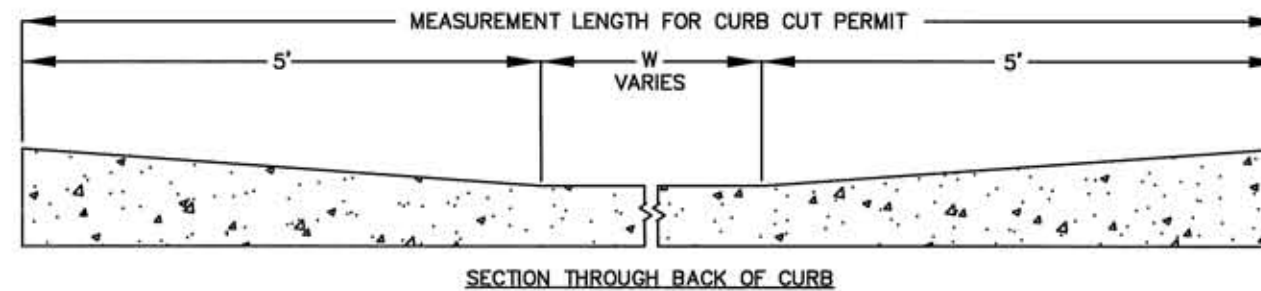
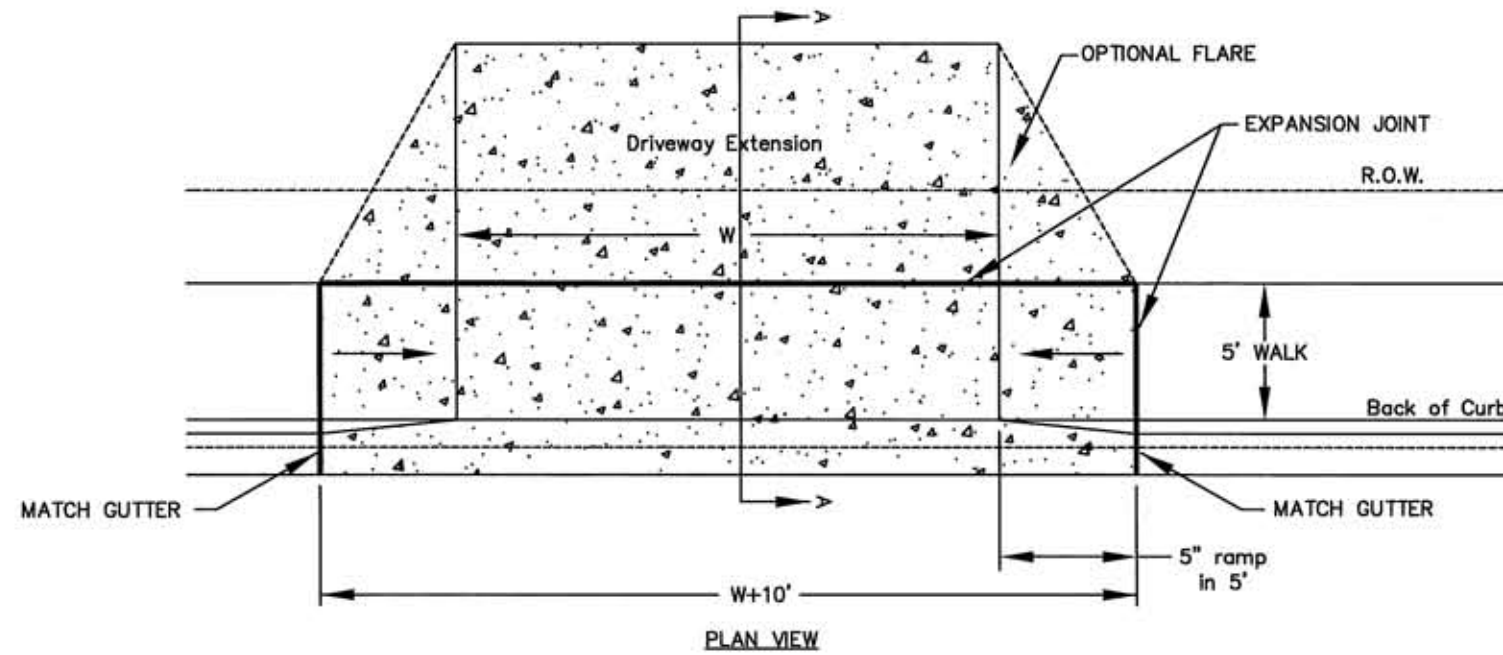


SECTION B-B




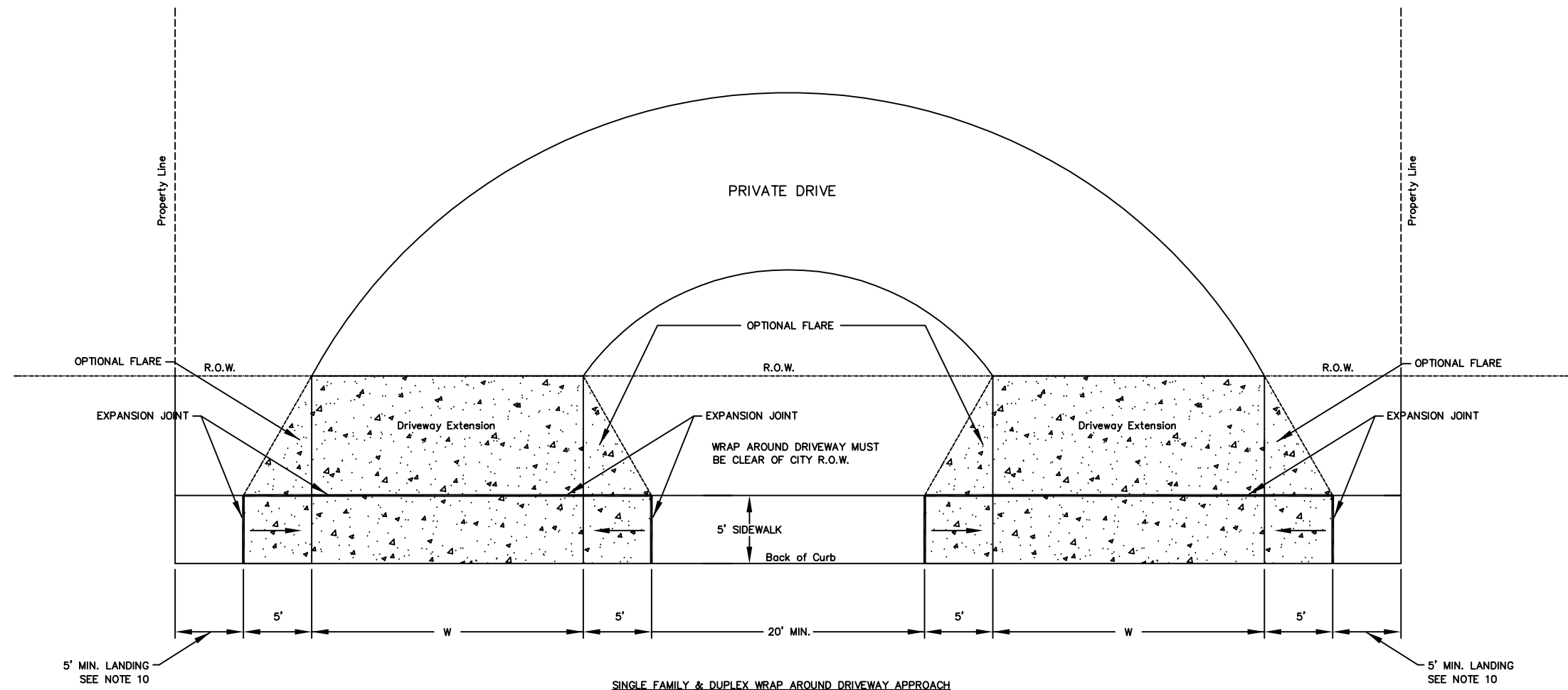
1. THE MINIMUM ELEVATION FOR THE DRIVEWAY AT THE PROPERTY LINE OR 25' BACK OF CURB, WHICHEVER COMES FIRST, SHALL BE THE TOP OF CURB ELEVATION.
2. OVER-EXCAVATION BELOW THE GRADE REQUIRED SHALL BE CORRECTED BY PLACING EXTRA CALICHE BASE OR BY THE USE OF SHARP GRAINED CONCRETE SAND OR CRUSHER FINES (CHAT).
3. DRIVEWAY SHALL BE CONSTRUCTED 6" OR 8" THICK THROUGH THE SIDEWALK AREA.
4. THE CONTRACTOR, AT HIS OPTION, MAY ELECT TO PLACE 8" OF CONCRETE INSTEAD OF PLACING 6" OF CONCRETE OVER 6" OF CALICHE BASE IN ALLEYS AND COMMERCIAL DRIVEWAYS.
5. CONCRETE SHALL BE CITY OF MIDLAND CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P.S.I.
6. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO CITY OF MIDLAND STANDARD CONSTRUCTION SPECIFICATIONS.
7. ALL SIDEWALKS AND RAMPS SHALL HAVE COARSE BROOM FINISH OR OTHER ROUGH NON-SKID TYPE FINISH AS APPROVED BY THE ENGINEER.
8. ALL WIRE REINFORCING SIZES ARE GAGE.
9. THE CITY ENGINEER MAY APPROVE WIDER OPENINGS FOR COMMERCIAL DRIVES TO ACCOMMODATE DIVIDED ENTRY/EXIT AND ANGLED DRIVES ON HIGH VOLUME, HIGH SPEED STREETS.
10. THE CONTRACTOR MAY AT HIS OPTION USE FIBERMESH OR CAPROLAN-RC OR APPROVED EQUAL IN LIEU OF 6" x 6" 6/6 GAGE WIRE MESH REINFORCING.
11. IF REMOVING CURB & GUTTER TO THIS LINE WILL LEAVE A SECTION OF CURB & GUTTER LESS THAN 4' IN LENGTH, THE CURB AND GUTTER SHALL BE REMOVED TO THE NEAREST JOINT INSTEAD OF SAWING.

3					CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION CITY DESIGN & CONSTRUCTION STANDARDS MULTI-FAMILY & COMMERCIAL DRIVE APPROACH	INDEX	MULT_COM_APP	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	P-8




1. CONCRETE SHALL BE CITY OF MIDLAND CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P.S.I.
2. THE CONTRACTOR SHALL USE FIBERMESH OR APPROVED EQUAL FOR CRACK CONTROL.
3. DRIVEWAY SHALL BE CONSTRUCTED 6" THICK FROM CURB TO PROPERTY LINE, OR 10' BEHIND CURB ON WIDER RIGHT-OF-WAYS.
4. MATCH GUTTER/FLOWLINE ELEVATION ON EACH END OF DRIVEWAY. WATER MUST FLOW IN GUTTER ACROSS THE DRIVEWAY.
5. ALL SIDEWALKS AND RAMPS SHALL HAVE COARSE BROOM FINISH OR OTHER ROUGH NON-SKID TYPE FINISH AS APPROVED BY THE ENGINEER.
6. THE MINIMUM ELEVATION FOR THE DRIVEWAY AT THE PROPERTY LINE OR 25' BACK OF CURB, WHICHEVER COMES FIRST, SHALL BE THE TOP OF CURB ELEVATION.
7. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO CITY OF MIDLAND STANDARD CONSTRUCTION SPECIFICATIONS.
8. OVER-EXCAVATION BELOW THE GRADE REQUIRED FOR THE DRIVEWAY SHALL BE CORRECTED BY PLACING EXTRA CONCRETE AT THE TIME THE DRIVEWAY IS PLACED OR BY USE OF SHARP GRAINED CONCRETE SAND OR CRUSHER FINES (CHAT) OR BY PLACING AND COMPACTING NATIVE SOIL IN THE AREA OVER EXCAVATED. NATIVE SOIL SHALL BE COMPACTED TO AT LEAST THE DENSITY OF THE SURROUNDING UNDISTURBED GROUND.
9. IF REMOVING CURB & GUTTER TO THIS LINE WILL LEAVE A SECTION OF CURB & GUTTER LESS THAN 4' IN LENGTH, THE CURB AND GUTTER SHALL BE REMOVED TO THE NEAREST JOINT INSTEAD OF SAWING.

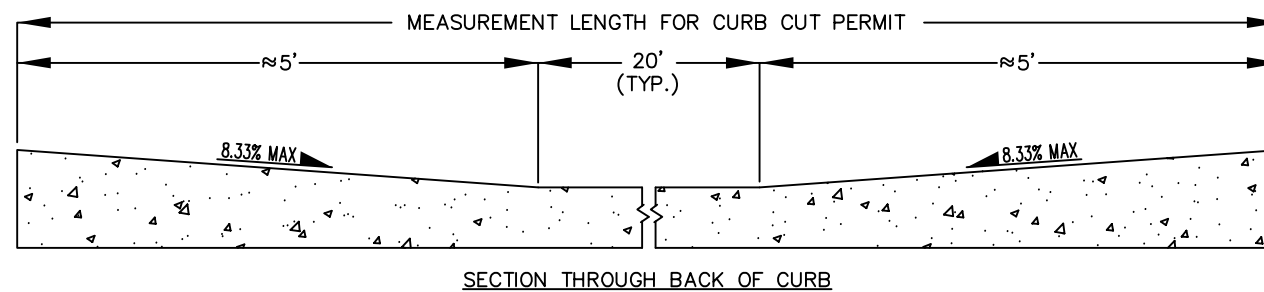
					Engineering Services Division Development Services Department City Design and Construction Standards Single Family & Duplex Driveway Approach	Dwg. Name	sing_dup_app09	Dwg. No.	P-9
Rev. No.	Date	By	Description			Drawn By	V.M. Lowe		
						Checked By	R. Franks	Date	June 2009
						Approved By	R. Franks	Scale	N.T.S.




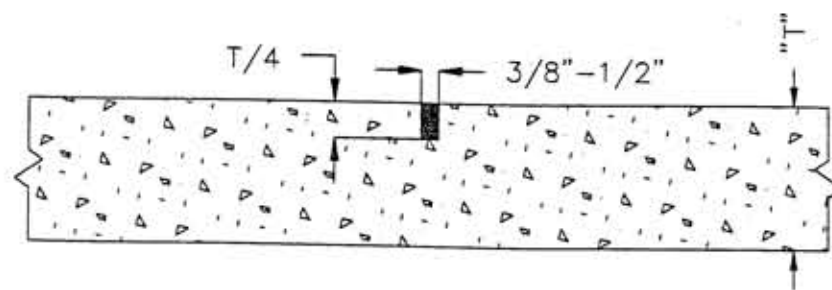
1. CONCRETE SHALL BE CITY OF MIDLAND CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P.S.I.
2. THE CONTRACTOR SHALL USE FIBERMESH OR APPROVED EQUAL FOR CRACK CONTROL.
3. DRIVEWAY SHALL BE CONSTRUCTED 6" THICK FROM CURB TO PROPERTY LINE, OR 10' BEHIND CURB ON WIDER RIGHT-OF-WAYS.
4. MATCH GUTTER/FLOWLINE ELEVATION ON EACH END OF DRIVEWAY. WATER MUST FLOW IN GUTTER ACROSS THE DRIVEWAY.
5. ALL SIDEWALKS AND RAMPS SHALL HAVE COARSE BROOM FINISH OR OTHER ROUGH NON-SKID TYPE FINISH AS APPROVED BY THE ENGINEER.
6. THE MINIMUM ELEVATION FOR THE DRIVEWAY AT THE PROPERTY LINE OR 25' BACK OF CURB, WHICHEVER COMES FIRST, SHALL BE THE TOP OF CURB ELEVATION.
7. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO CITY OF MIDLAND STANDARD CONSTRUCTION SPECIFICATIONS.
8. OVER-EXCAVATION BELOW THE GRADE REQUIRED FOR THE DRIVEWAY SHALL BE CORRECTED BY PLACING EXTRA CONCRETE AT THE TIME THE DRIVEWAY IS PLACED OR BY USE OF SHARP GRAINED CONCRETE SAND OR CRUSHER FINES (CHAT) OR BY PLACING AND COMPACTING NATIVE SOIL IN THE AREA OVER EXCAVATED. NATIVE SOIL SHALL BE COMPACTED TO AT LEAST THE DENSITY OF THE SURROUNDING UNDISTURBED GROUND.
9. IF REMOVING CURB & GUTTER TO THIS LINE WILL LEAVE A SECTION OF CURB & GUTTER LESS THAN 4' IN LENGTH, THE CURB AND GUTTER SHALL BE REMOVED TO THE NEAREST JOINT INSTEAD OF SAWING.
10. LANDING MAY BE CLOSER THAN 5' FROM PROPERTY LINE WITH ADJOINING PROPERTY OWNER'S CONSENT. CONSENT FORMS ARE AVAILABLE IN DEVELOPMENT SERVICES. APPROVAL FROM ADJOINING PROPERTY OWNER DOES NOT GUARENTEE DEVELOPMENT SERVICES APPROVAL. UNDER NO CIRCUMSTANCE WILL RAMP START IN FRONT OF ADJOINING PROPERTY OWNER'S PROPERTY.
11. CONSTRUCT APPROACHES AS DETAILED ON SINGLE FAMILY & DUPLEX DRIVEWAY APPROACH DETAIL.
12. THIS DETAIL ONLY APPLIES WHEN ADJACENT PROPERTY IS NOT AN ALLEY. A MINIMUM 15' IS REQUIRED BETWEEN DRIVEWAY THROAT AND ALLEY PAVING.

Minimum Lot Width for Wrap-Around Driveways			
Driveway Width (FT) (w)	Lot Width (FT): No Standup Curb Waiver Agreement	Lot Width (FT): 1 Standup Curb Waiver Agreement	Lot Width (FT): 2 Standup Curb Waiver Agreement
10	70	65	60
11	72	67	62
12	74	69	64
13	76	71	66
14	78	73	68
15	80	75	70
16	82	77	72
17	84	79	74
18	86	81	76
19	88	83	78
20	90	85	80
21	92	87	82
22	94	89	84
23	96	91	86
24	98	93	88
25	100	95	90
26	102	97	92
27	104	99	94
28	106	101	96
29	108	103	98
30	110	105	100

					Engineering Services Division Development Services Department City Design and Construction Standards Single Family & Duplex Wrap-Around Driveway Layout	Dwg. Name	sing_dup_wraparound_drv_app.	Dwg. No.	P-9A
						Drawn By	V.M. LOWE		
						Checked By	S. SWONKE	Date	APRIL 2011
Rev. No.	Date	By	Description			Approved By	S. SWONKE	Scale	N.T.S.

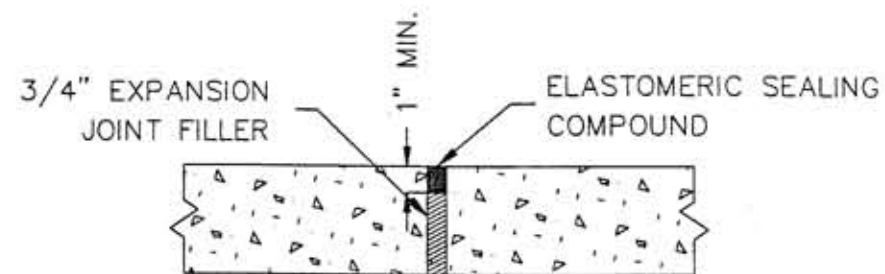


					Engineering Services Division	Dwg. Name	alley_app10.dwg	Dwg. No.	P-10
					Development Services Department	Drawn By	S. Swonke		
					City Design and Construction Standards	Checked By	R. Franks	Date	Sept. 2010
Rev. No.	Date	By	Description		CITY OF MIDLAND	Alley Approach	Approved By	R. Franks	Scale



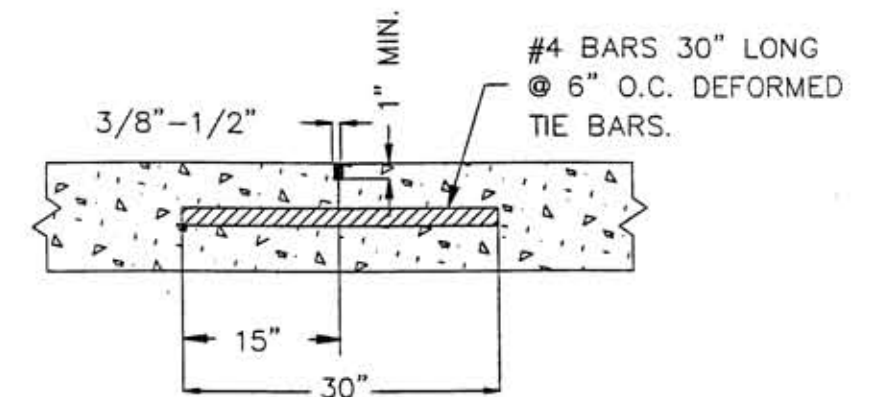
TRAVERSE CONTRACTION JOINT, SAWED AND FILLED WITH ELASTOMERIC SEALING COMPOUND, 15' SPACING FOR CENTER DRAIN AND CHANNEL FLUME. SPACING FOR OTHER CONCRETE WORK SHALL BE AS CALLED FOR IN THE SPECIFICATIONS AND NOTED ON THE PLANS AND DETAILS.

TYPE A




60' SPACING ON CHANNEL FLUME, 60' SPACING ON CENTER DRAIN, EXPANSION JOINT MATERIAL SHALL BE CUT TO CONFORM TO THE CROSS-SECTION OF THE STRUCTURE. SPACING SHALL BE AS CALLED FOR IN THE SPECIFICATIONS AND NOTED ON THE PLANS AND DETAILS.

DOWEL-LESS EXPANSION JOINT



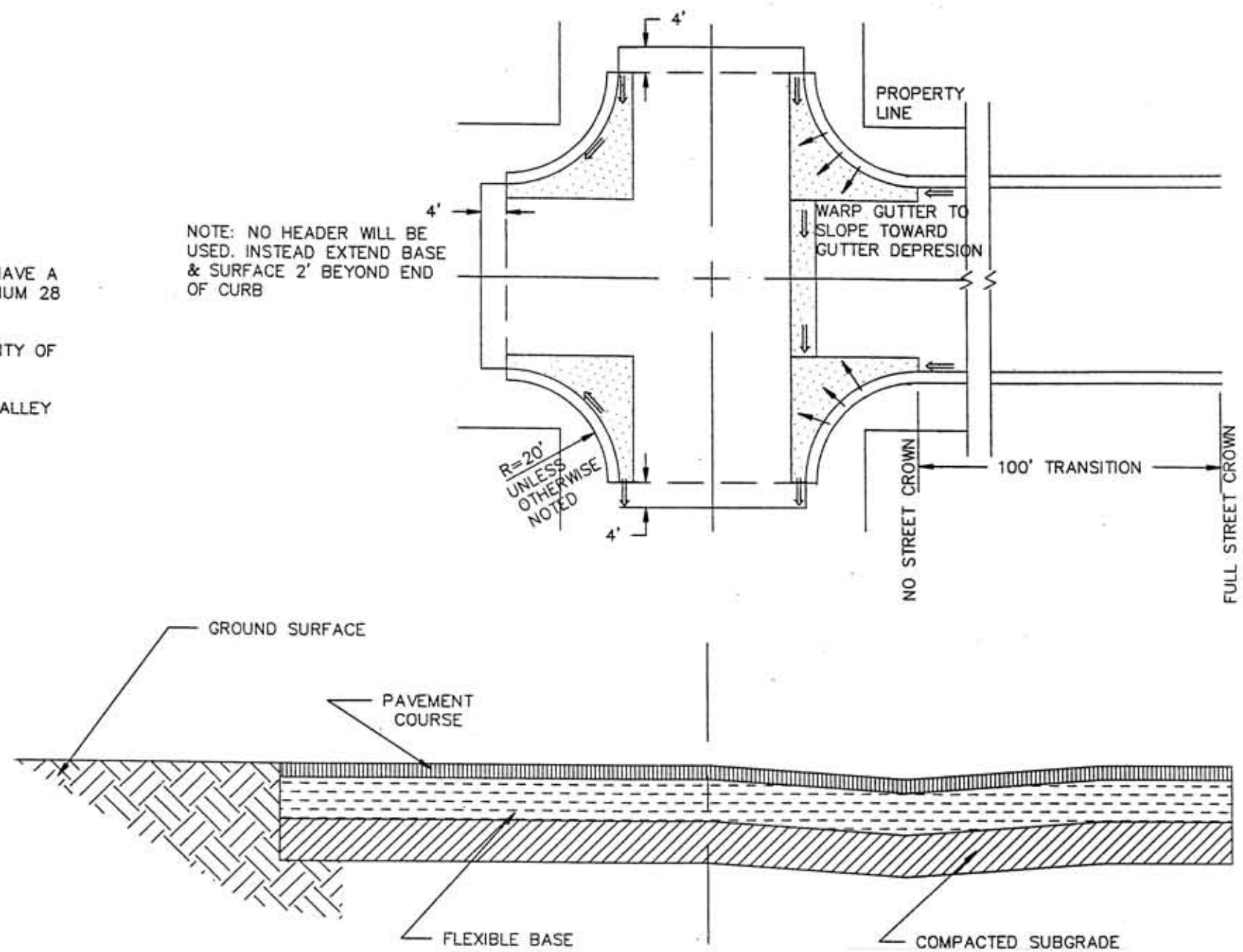
TIED TRANSVERSE CONSTRUCTION JOINT, FOR USE WHEN NOT AT A JOINT LOCATION. SEALING CHANNEL SHALL BE A MINIMUM OF 1" IN DEPTH AND SHALL BE EDGED USING A TOOL WITH A 3/8" RADIUS.


TYPE E

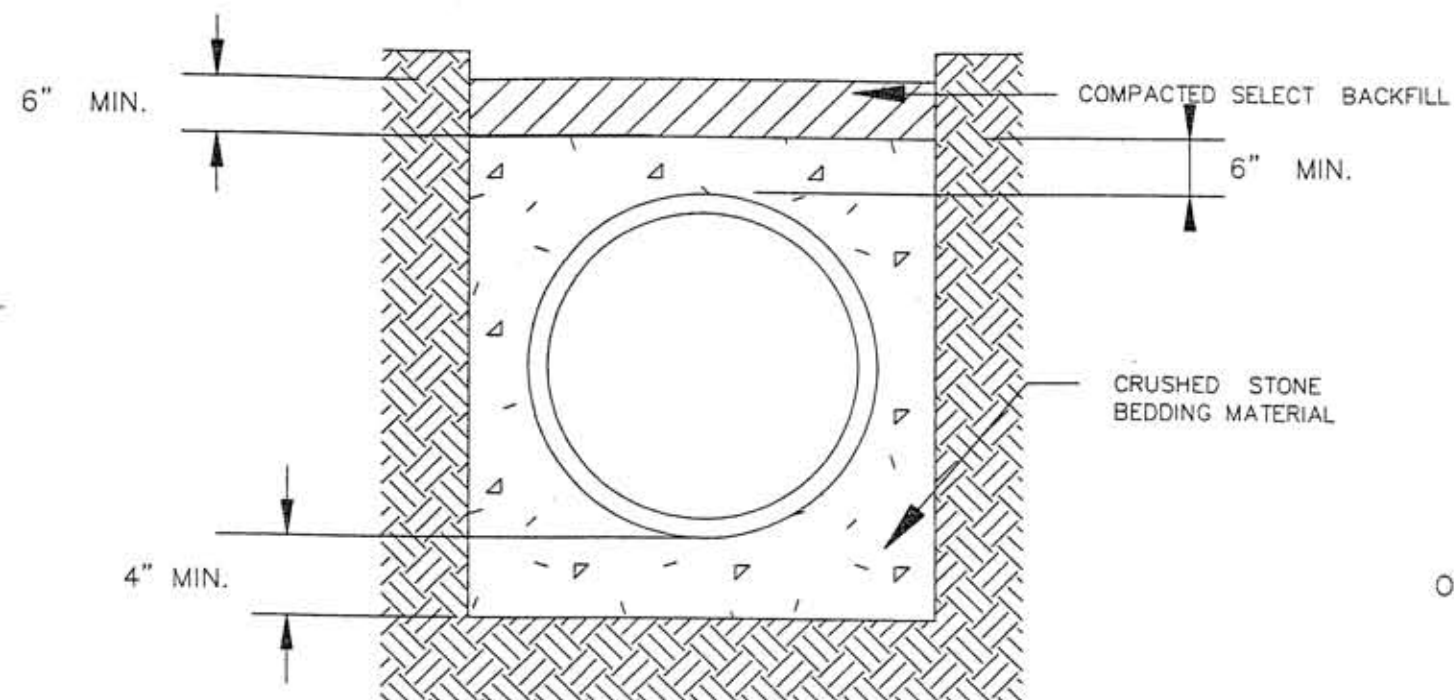
3					<p>CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p> <p>CITY DESIGN & CONSTRUCTION STANDARDS EXPANSION JOINTS</p>	INDEX	EXPAN_JT	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	P-11

1. CONCRETE SHALL BE CITY OF MIDLAND CLASS "A" AND SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 P.S.I.
2. MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO CITY OF MIDLAND STANDARD SPECIFICATIONS.
3. USE CONCRETE FILLETS ON ALL STREET RADII, USE CONCRETE VALLEY GUTTERS WHEN THE CROSS GRADE IS LESS THAN 1%.

NOTE: NO HEADER WILL BE USED. INSTEAD EXTEND BASE & SURFACE 2' BEYOND END OF CURB

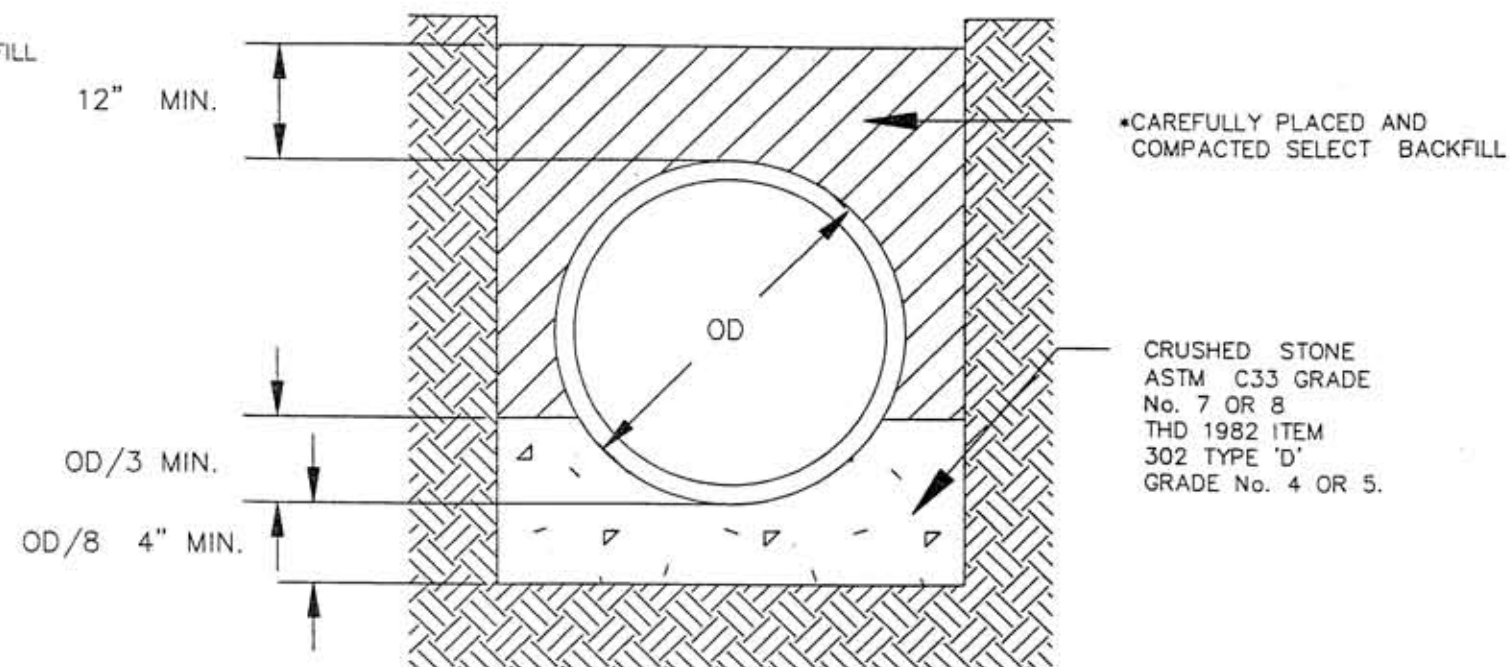


3					<p>CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p> <p>CITY DESIGN & CONSTRUCTION STANDARDS INTERSECTION PAVEMENT</p>	INDEX	INTER_PAV	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	P-12




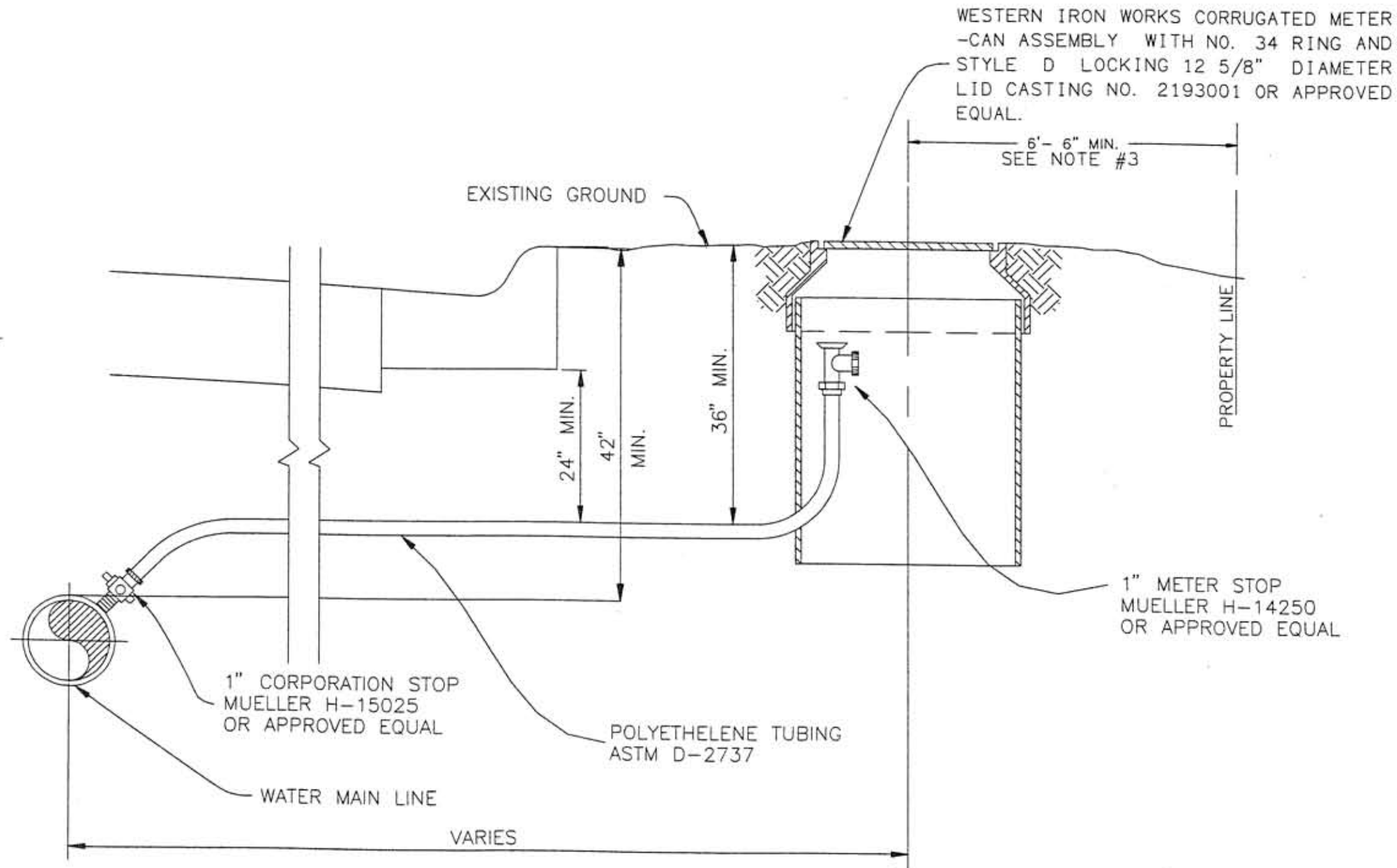
MINIMUM BEDDING FOR
C-900 PVC WATERLINES

NOTE:
WHEN BACKFILL IS TO BE MADE USING
CRUSHER FINES (CHAT) THE CONTRACTOR
MAY USE CRUSHER FINES INSTEAD OF
SELECTED BACKFILL AT HIS OPTION




CLASS 'C' MINIMUM BEDDING
FOR DUCTILE-IRON PIPE

3					<p>CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p> <p>CITY DESIGN & CONSTRUCTION STANDARDS WATER LINE BEDDING</p>	INDEX	WL_BED	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	W-1



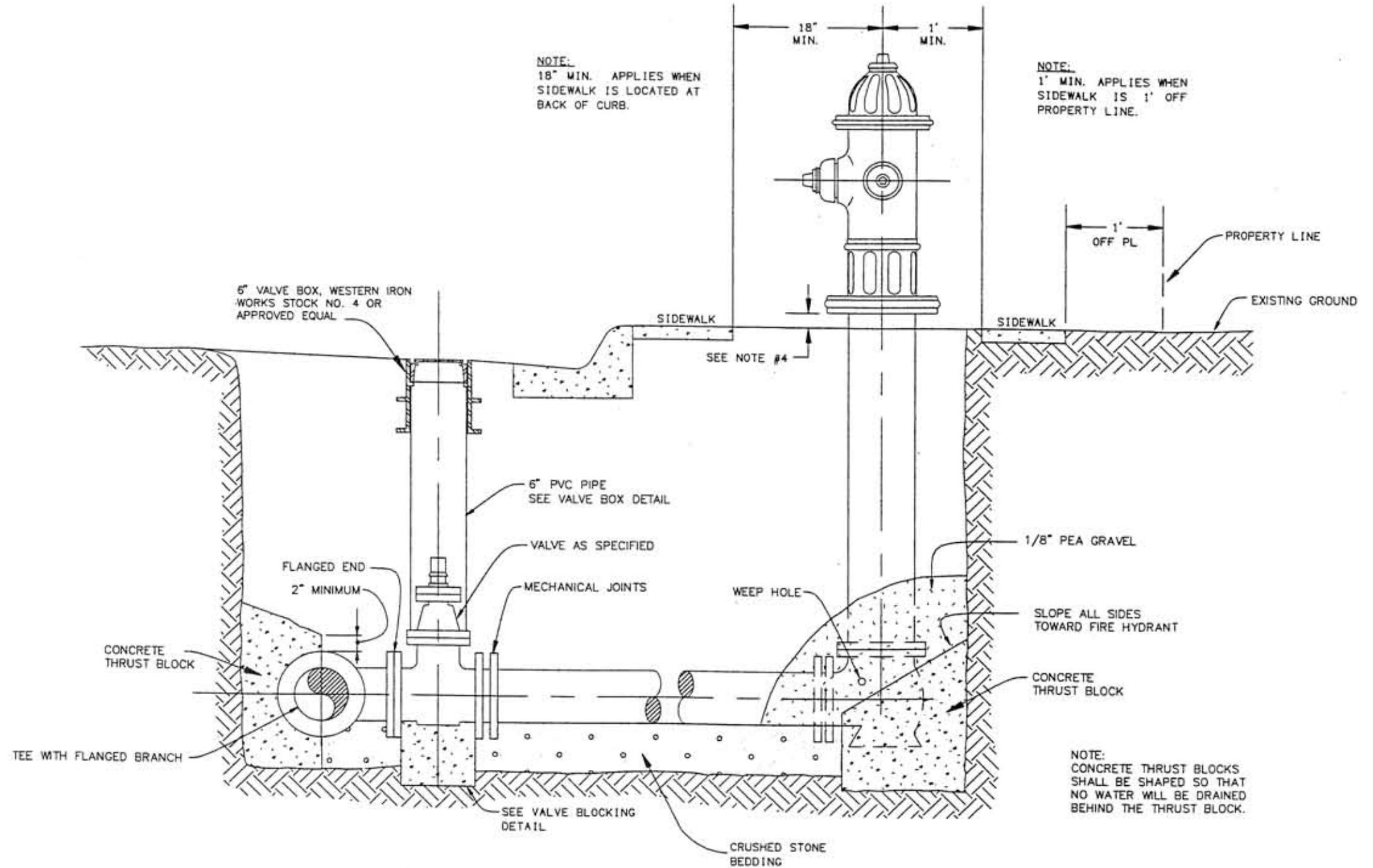
NOTE:


1. ALL WATER SERVICES TO BE 1" EXCEPT WHERE LARGER SIZES ARE CALLED FOR ON THE PLANS
2. WHEN THE SIZE SERVICE CALLED FOR ON THE PLANS WILL NOT ALLOW ADEQUATE THREAD ENGAGEMENT ON THE DUCTILE IRON WATER MAIN USE MUELLER H-16102 BRONZE STRAP SERVICE CLAMP WITH I.P. THREAD.
3. THE DISTANCE FROM PROPERTY LINE SHOWN IS FOR 4' WALK PLACE 1' OFF THE PROPERTY LINE. WHEN 5' WALK IS PLACED AT THE BACK OF CURB METER BOXES SHOULD BE PLACED A MINIMUM OF 6' - 6" FROM THE BACK OF CURB.
4. LARGER WATER SERVICE CONNECTIONS MAY BE CALLED FOR ON THE PLANS AND BID PROPOSAL. USE WESTERN IRON WORKS CORRUGATED METER-CAN ASSEMBLY WITH NO. 548B RING AND NO. 5 TEXAS SPECIAL LOCKING LID OR APPROVED EQUAL.

3					CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION	INDEX	METER_CON	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1					CITY DESIGN & CONSTRUCTION STANDARDS WATER METER SERVICE CONNECTION	CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	W-2

NOTE.

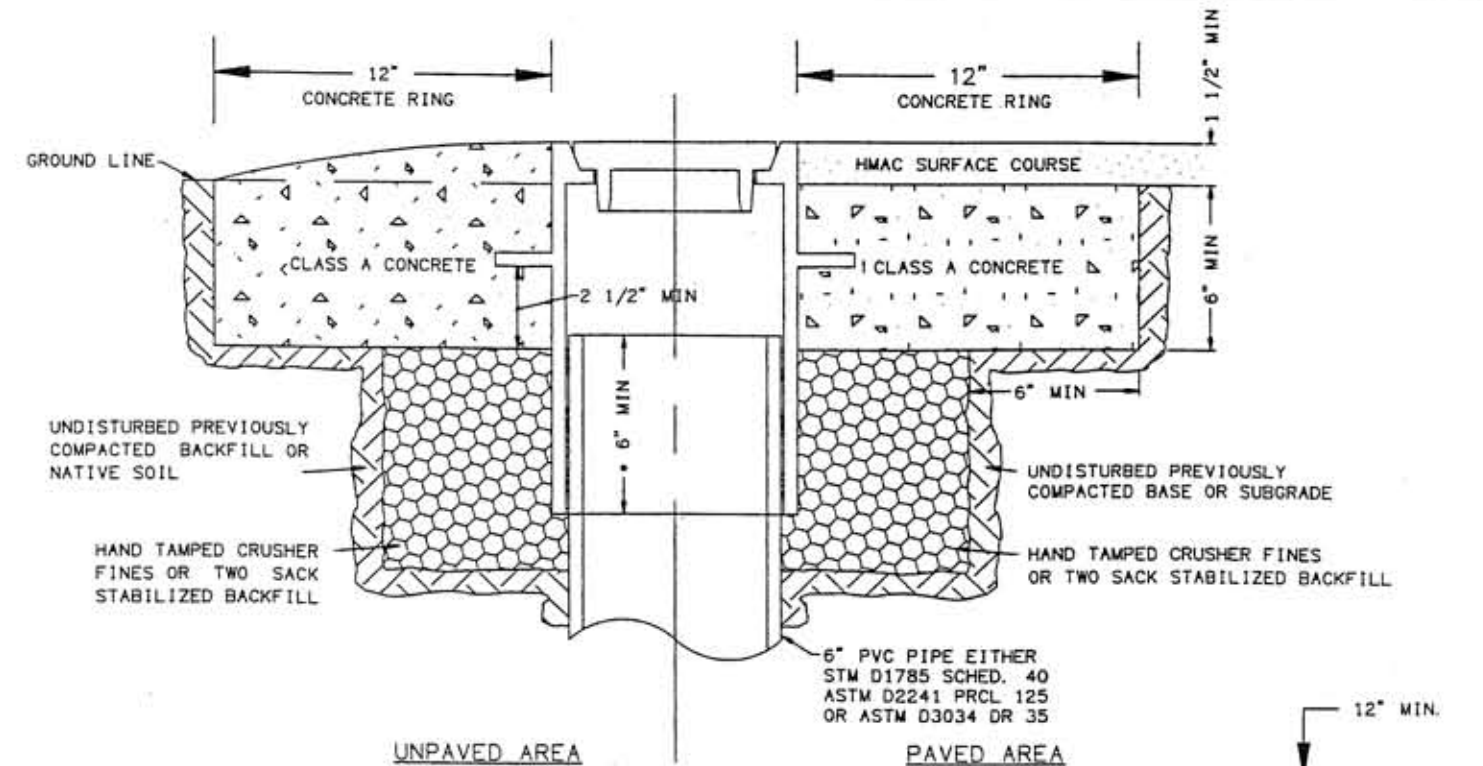
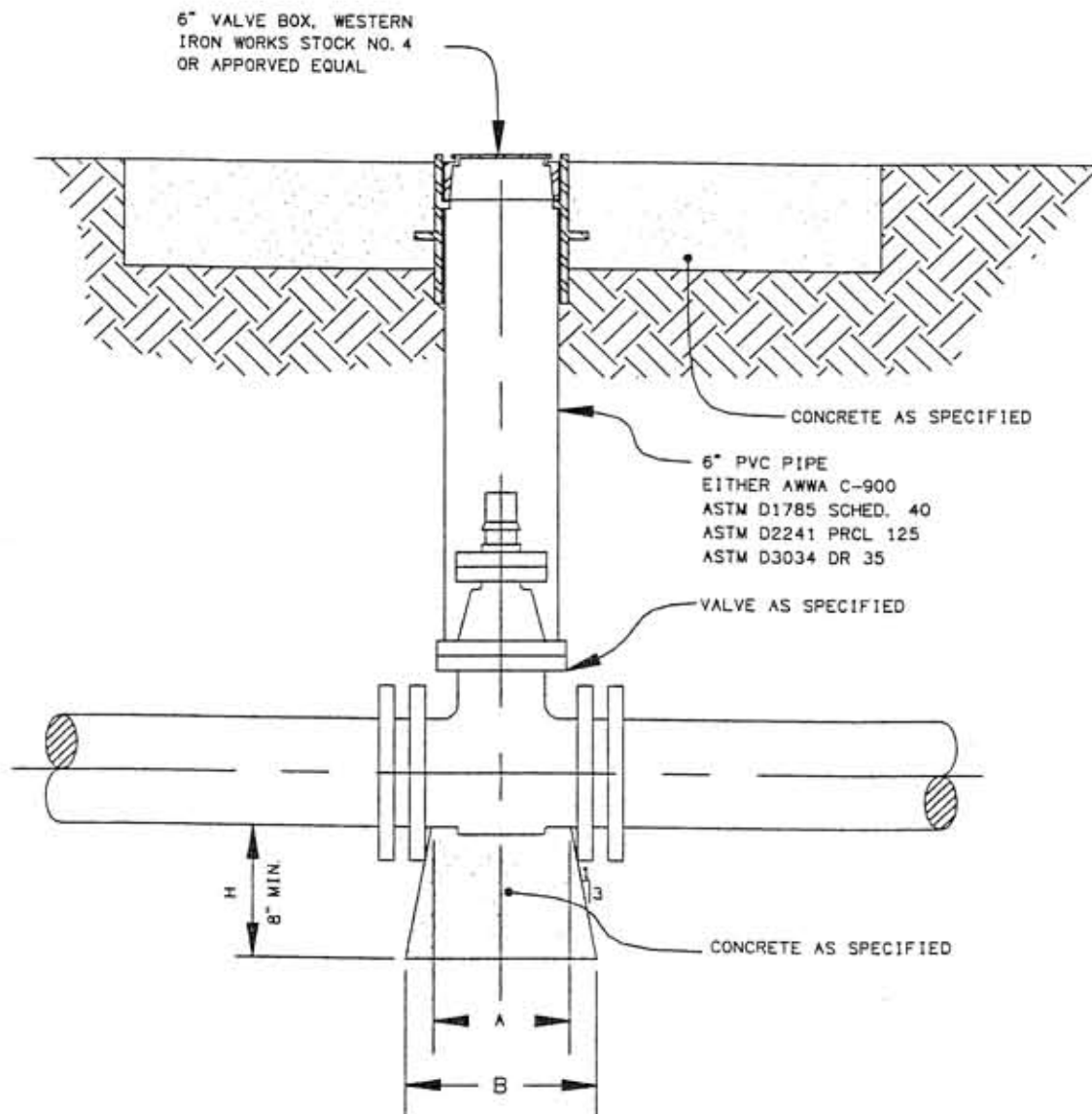
1. FIRE HYDRANTS AT STREET INTERSECTIONS ARE TO BE LOCATED AT THE NORTH END OF THE NORTHWEST RETURN RADIUS UNLESS NOTED OTHERWISE ON THE PLANS.
2. ALL VALVE BOXES ARE TO BE SET IN A CONCRETE COLLAR WHEN PLACED AT THEIR FINAL GRADE. SEE VALVE BOX INSTALLATION DETAIL DRAWING.
3. LEAVE VALVE BOX 6" TO 10" ABOVE GRADE FOR NEW SUBDIVISION AND OTHER STREETS AND ALLEYS SCHEDULED FOR IMMEDIATE PAVING UNTIL STREET WORK IS DONE. THE PAVING CONTRACTOR SHALL ADJUST THE VALVE BOX TO FINISHED GRADE BEFORE PLACING LAST COURSE OF HMA SURFACE.
4. FRANGIBLE FLANGE OF FIRE HYDRANT SHALL BE SET A MINIMUM OF 2" AND A MAXIMUM OF 6" ABOVE SIDEWALK ELEVATION.
5. ON STREETS WHERE NO SIDEWALK IS TO BE CONSTRUCTED, SET CENTERLINE OF FIRE-HYDRANT AT 3' BACK OF CURB.
6. FIRE HYDRANT CUT-OFF VALVE SHALL BE PLACED A MINIMUM OF 3' FROM THE CENTER LINE OF THE FIRE HYDRANT. THIS MAY REQUIRE THE USE OF A 90° BEND TO OFF-SET THE FIRE HYDRANT.



3					<p>CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p>	INDEX	FIRE_HYD	SCALE	N.T.S.
2						DRAWN	A.R.Karch/S.B.		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION		CITY DESIGN & CONSTRUCTION STANDARDS FIRE HYDRANT DETAIL	APPROVED	J.P.R.	DWG. NO.	W-3

NOTE:

SETTING VALVE BOX TO GRADE MAY REQUIRE ADDING PVC PIPE. IF ADDITIONAL PIPE IS REQUIRED, USE BELL SECTION WITH GASKET AND SET BELL DOWN OVER EXISTING PIPE RISER. A GASKETTED SELF CENTERING COLLAR MAY BE USED IN LIEU OF THE BELL SECTION.



DETAIL FOR SETTING VALVE BOX

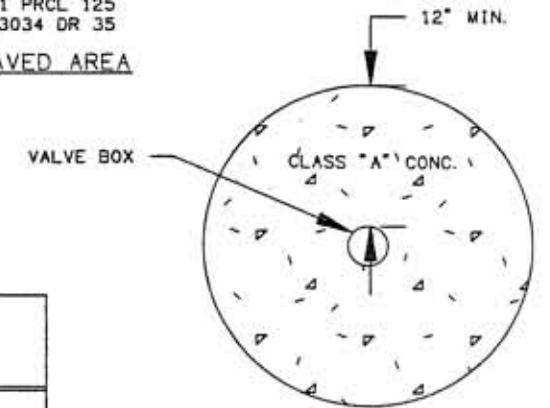
VALVE BLOCKING CHART


PIPE SIZE	① VALVE TYPE	A	③ B	② C	H
4"	RSG	5.00"	0' - 10.50"	1' - 4"	8
6"	RSG	6.50"	1' - 0"	1' - 6"	8
8"	RSG	6.50"	1' - 0"	1' - 8.50"	8
10"	RSG	8.00"	1' - 1"	1' - 10"	8
12"	RSG	8.50"	1' - 2"	2' - 0"	8
④ 16"	BF	5.90"	0' - 11.50"	2' - 6"	8

NOTE:

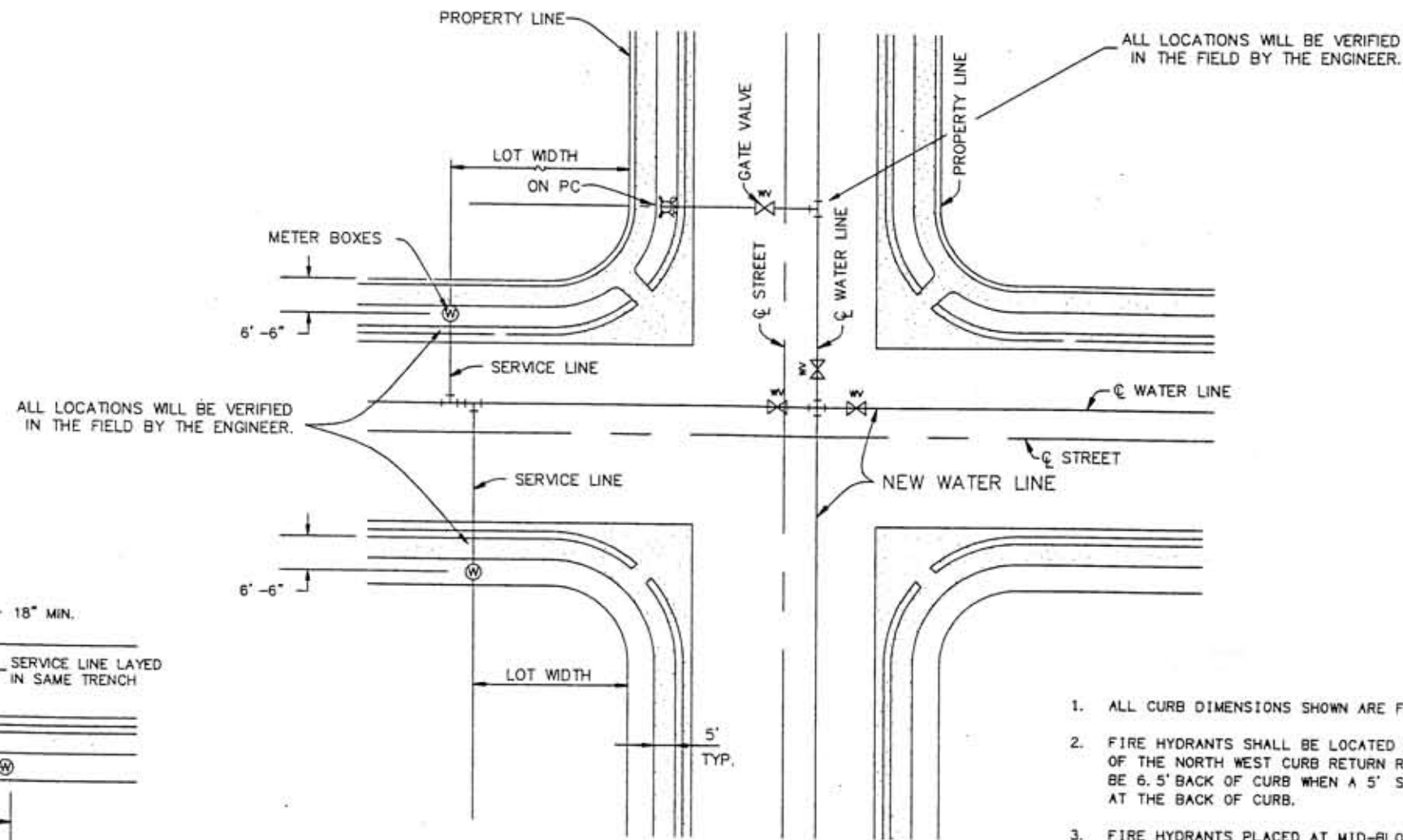
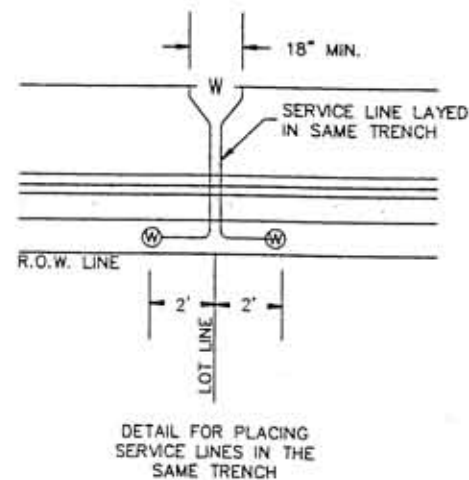
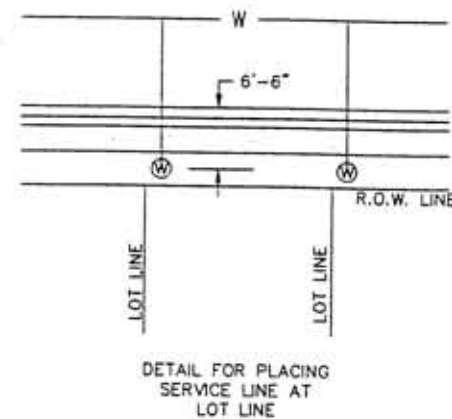
ALL THRUST BLOCKING SHALL BE CLASS "A" CONCRETE AND SHALL BE PLACED AGAINST UNDISTURBED EARTH. VALVE SHALL BE POLY WRAPPED BEFORE PLACING BLOCKING

- ① RSG - RESILIENT SEAT GATE VALVE
BF - RESILIENT SEAT BUTTERFLY VALVE
- ② C - DEPTH OF BEARING FOR VALVE BLOCKING = NOMINAL TRENCH WIDTH
BATTER FOR VALVE BLOCK IS 1:3
- ③
- ④ BLOCKING FOR VALVES LARGER THAN 16" SHALL BE AS SHOWN ON THE PLANS




3					CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION CITY DESIGN & CONSTRUCTION STANDARDS VALVE & VALVE BOX INSTALLATION	INDEX	VALV_BX	SCALE	N.T.S.
2						DRAWN	A.R.Karch/S.B.		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	B.R.G.	DWG. NO.	W-4

-  BUTTERFLY VALVE
-  GATE VALVE
-  TEE
-  CROSS
-  FIRE HYDRANT
-  METER BOX



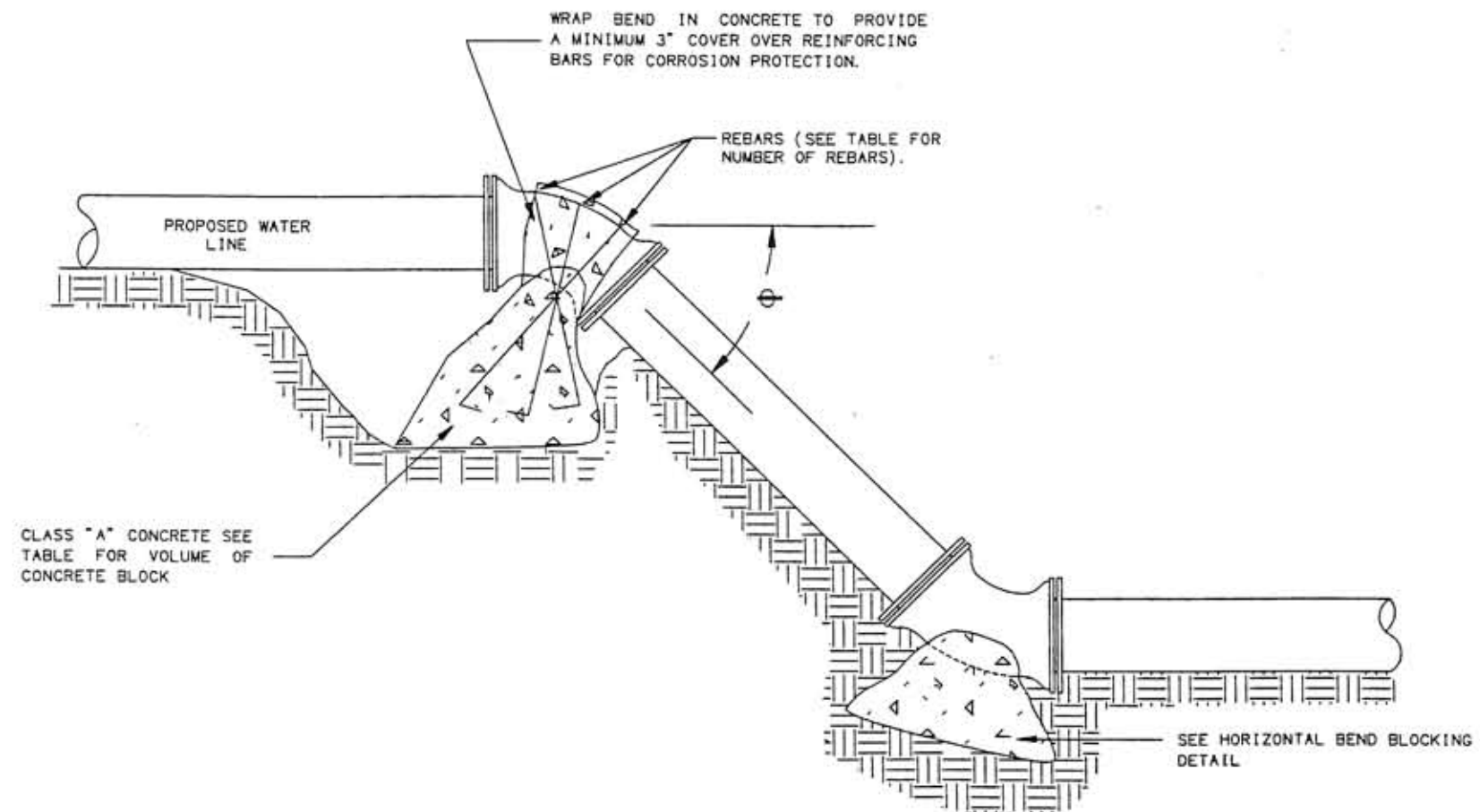
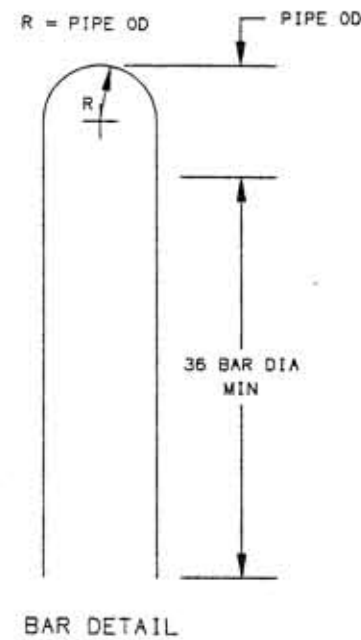
1. ALL CURB DIMENSIONS SHOWN ARE FROM BACK OF CURB
2. FIRE HYDRANTS SHALL BE LOCATED AT THE NORTH END OF THE NORTH WEST CURB RETURN RADIUS AND SHALL BE 6.5' BACK OF CURB WHEN A 5' SIDEWALK IS PLACED AT THE BACK OF CURB.
3. FIRE HYDRANTS PLACED AT MID-BLOCK SHALL BE PLACED IN LINE WITH A LOT LINE
4. TWO SERVICE LINES MAY BE PLACED IN THE SAME TRENCH. EACH TAP MUST BE SEPARATED AND HAVE BOTH A CORPERATION STOP AND A METER STOP. "BULLHEAD" TAPS ARE NOT PERMITTED.


3					CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION CITY DESIGN & CONSTRUCTION STANDARDS UTILITY INTERSECTION LAYOUT	INDEX	UTIL_INT	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	W-5

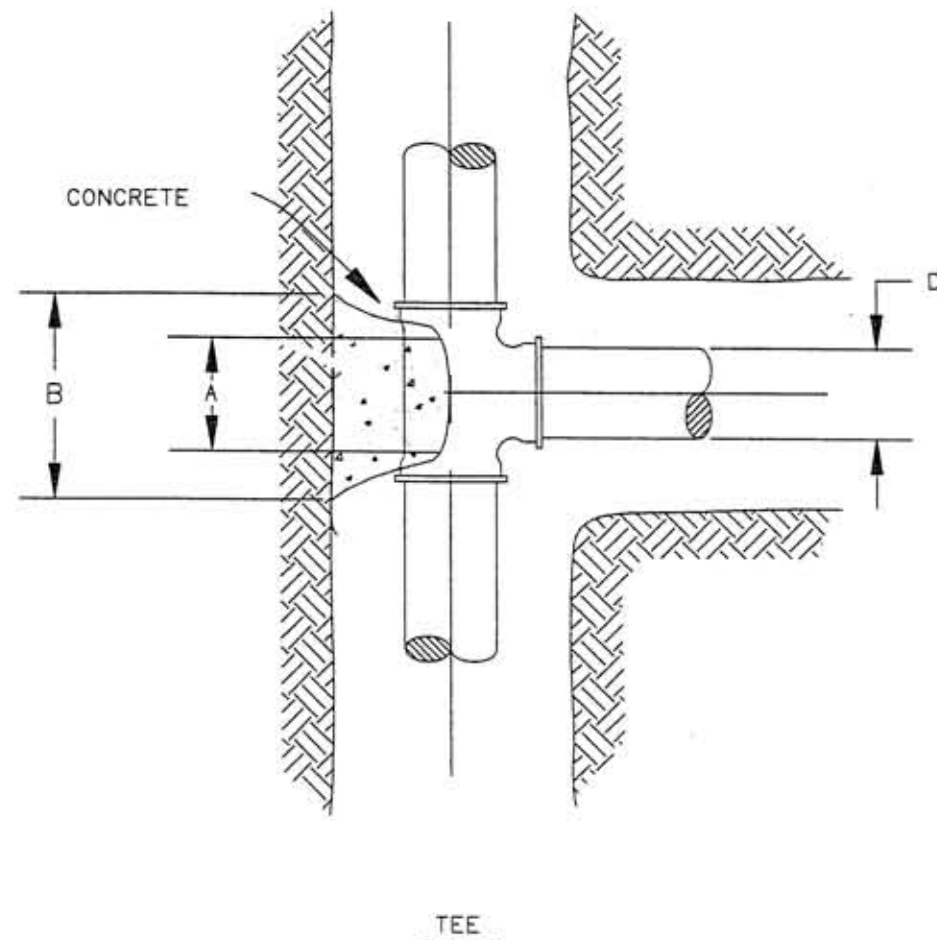
BLOCK FOR EXTERNAL VERTICAL BENDS
DESIGN PRESSURE 180 PSI

DIA. OF PIPE	DEGREE OF BEND \ominus							
	11 1/4°		22 1/2°		45°		90°	
	VOLUME BLOCK	REBARS NO. SIZE	VOLUME BLOCK	REBARS NO. SIZE	VOLUME BLOCK	REBARS NO. SIZE	VOLUME BLOCK	REBARS NO. SIZE
4"	3 C.F.	2-#3	6 C.F.	2-#3	12 C.F.	2-#3	22 C.F.	2-#3
6"	7 C.F.	2-#3	13 C.F.	2-#3	26 C.F.	2-#3	1.0 C.Y.	2-#3
8"	12 C.F.	2-#3	24 C.F.	2-#3	2.0 C.Y.	2-#4	3.0 C.Y.	3-#4
10"	19 C.F.	2-#3	1.5 C.Y.	2-#4	3.0 C.Y.	3-#4	5.0 C.Y.	2-#6
12"	1.0 C.Y.	2-#3	2.0 C.Y.	2-#4	4.0 C.Y.	2-#6	7.0 C.Y.	2-#8
14"	1.5 C.Y.	2-#4	3.0 C.Y.	3-#4	5.5 C.Y.	2-#6		
16"	2.0 C.Y.	2-#4	3.5 C.Y.	3-#4	7.0 C.Y.	2-#7		

BLOCKING FOR 14" AND 16" 90° BENDS
AND FOR ALL BENDS LARGER THEN 16"
WILL BE SHOWN ON THE PLANS



3					<p style="text-align: center;">CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p> <p style="text-align: center;">CITY DESIGN & CONSTRUCTION STANDARDS BLOCKING FOR VERTICAL BENDS</p>	INDEX	BLK_V_B	SCALE	N.T.S.
2						DRAWN	A.R.Karch/S.B.		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	W-6



"T" BLOCKING
DESIGN 180 PSI LINE PRESSURE
SOIL BEARING CAP 2K/SF

"T" RUN DIA	STEM DIA	BLOCKING DIMENSIONS		
		A	B	*C
TEE				
4"	ALL	0'-11"	1'-0"	1'-0"
6"	ALL	1'-2"	1'-7"	1'-0"
8"	ALL	1'-4"	2'-2"	2'-2"
10"	ALL	1'-8"	2'-8"	2'-8"
12"	THRU 6"	1'-10"	1'-10"	1'-8"
12"	OVER 6"	1'-10"	3'-2"	3'-2"
14"	THRU 8"	2'-2"	2'-2"	1'-11"
14"	OVER 8"	2'-2"	3'-8"	3'-8"
16"	THRU 8"	2'-4"	2'-4"	2'-2"
16"	OVER 8"	2'-4"	4'-3"	4'-3"


*C - VERTICAL DEPTH OF CONCRETE
BEARING ON UNDISTURBED EARTH

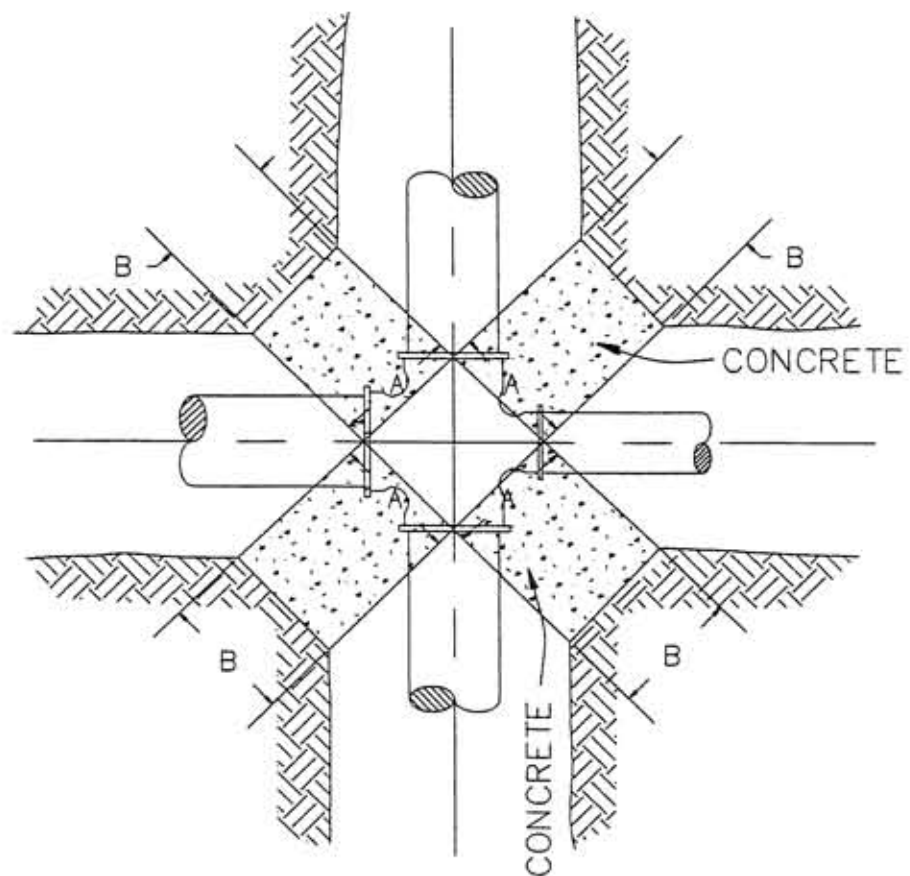
NOTE:

BLOCKING FOR TEES LARGER THEN 16"
RUN WILL BE AS SHOWN ON THE PLANS

ALL THRUST BLOCKING SHALL BE CLASS
"A" CONCRETE AND SHALL BE PLACED
AGAINST UNDISTURBED EARTH.

FITTINGS SHALL BE POLY WRAPPED
BEFORE BLOCKING IS PLACED

3					CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION	INDEX	BLK_TEE	SCALE	N.T.S.
2						DRAWN	A.R.Karch/S.B.		
1					CITY DESIGN & CONSTRUCTION STANDARDS BLOCKING FOR TEE	CHECKED	A.R.Karch/S.B.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	W-7



CROSS BLOCKING

CROSS BLOCKING
DESIGN 180 PSI LINE PRESSURE
SOIL BEARING CAP 2K/SF

CROSS DIA	BLOCKING DIMENSIONS		
	A	B	*C
4" x 4"	0' -11"	1' -0"	1' -0"
6" x 6"	1' -2"	1' -7"	1' -0"
8" x 8"	1' -4"	2' -2"	2' -2"
10" x 10"	1' -8"	2' -8"	2' -8"
12" x 12"	1' -10"	3' -2"	3' -2"
14" x 14"	2' -2"	3' -8"	3' -8"
16" x 16"	2' -4"	4' -3"	4' -3"

*C - VERTICAL DEPTH OF CONCRETE
BEARING ON UNDISTURBED EARTH


NOTE:

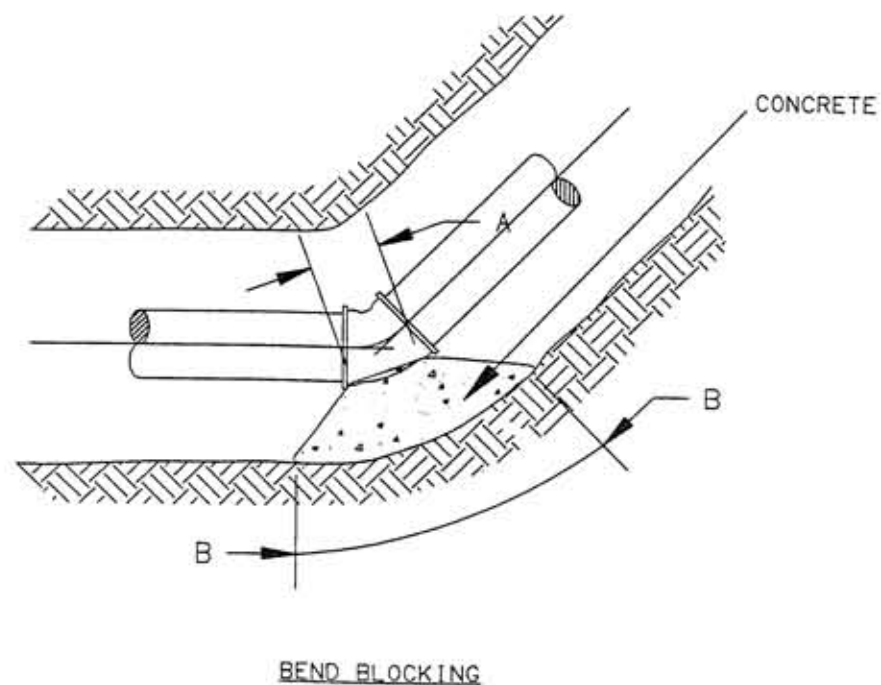
CROSSES WITH DIFFERENT SIZE RUN
SHALL BE BLOCKED FOR THE LARGER
RUN IN ALL DIRECTIONS

BLOCKING FOR CROSS LARGER THEN 16"
WILL BE AS SHOWN ON THE PLANS

ALL THRUST BLOCKING SHALL BE CLASS
"A" CONCRETE AND SHALL BE PLACED
AGAINST UNDISTURBED EARTH.

FITTINGS SHALL BE POLY WRAPPED
BEFORE BLOCKING IS PLACED

3					<p>CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p> <p>CITY DESIGN & CONSTRUCTION STANDARDS BLOCKING FOR CROSS</p>	INDEX	BLK_CR_DB	SCALE	N.T.S.
2						DRAWN	A.R.Karch/S.B.		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	W-8



BLOCKING FOR HORIZONTAL BENDS
DESIGN 180 PSI LINE PRESSURE
SOIL BEARING CAP 2K/SF

DIA. OF PIPE	DEGREE OF BEND											
	11 1/4°			22 1/2°			45°			90°		
	A	B	*C	A	B	*C	A	B	*C	A	B	*C
4"	0'-4"	1'-0"	1'-0"	0'-5"	1'-0"	1'-0"	0'-6"	1'-0"	1'-0"	0'-11"	1'-3"	1'-3"
6"	0'-7"	1'-0"	1'-0"	0'-7"	1'-0"	1'-0"	0'-8"	1'-5"	1'-5"	1'-3"	1'-11"	1'-11"
8"	0'-8"	0'-10"	1'-2"	0'-9"	1'-4"	1'-4"	0'-10"	1'-10"	1'-10"	1'-6"	2'-6"	2'-6"
10"	0'-10"	1'-0"	1'-5"	0'-11"	1'-8"	1'-8"	1'-1"	2'-4"	2'-4"	1'-11"	3'-2"	3'-2"
12"	1'-0"	1'-3"	1'-8"	1'-1"	2'-0"	2'-0"	1'-4"	2'-10"	2'-10"	2'-2"	3'-10"	3'-10"
14"	0'-11"	1'-5"	1'-11"	1'-1"	2'-4"	2'-4"	1'-4"	3'-3"	3'-3"			
16"	1'-1"	1'-8"	2'-2"	1'-2"	2'-8"	2'-8"	1'-5"	3'-9"	3'-9"			


NOTE:

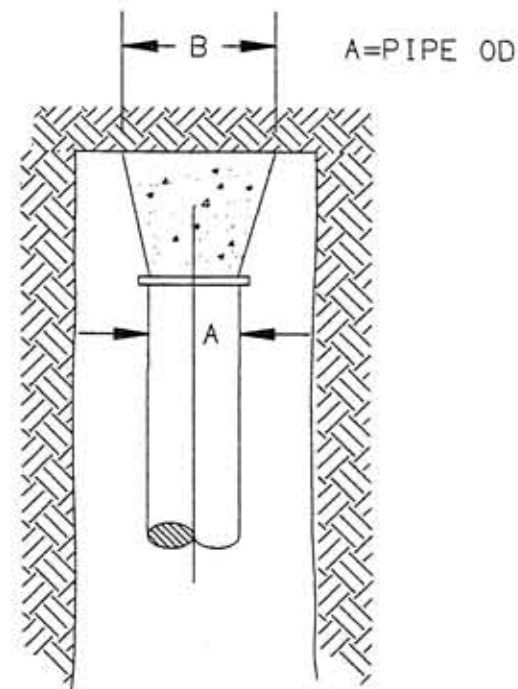
BLOCKING FOR 14" AND 16" 90° BENDS
AND ALL BENDS LARGER THEN 16" WILL
BE AS SHOWN ON THE PLANS

*C - VERTICAL DEPTH OF CONCRETE
BEARING ON UNDISTURBED EARTH

ALL THRUST BLOCKING SHALL BE CLASS
"A" CONCRETE AND SHALL BE PLACED
AGAINST UNDISTURBED EARTH

FITTINGS SHALL BE POLY WRAPPED
BEFORE BLOCKING IS PLACED

3					<p>CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p>	INDEX	BLK_H_BEND	SCALE	N.T.S.
2						DRAWN	S.B.		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	W-9



PLUG BLOCKING


PIPE OD	BLOCKING DIMENSIONS	
	B	*C
4"	1' -0"	1' -0"
6"	1' -7"	1' -0"
8"	2' -2"	2' -2"
10"	2' -8"	2' -8"
12"	3' -2"	3' -2"
14"	3' -8"	3' -8"
16"	4' -3"	4' -3"

*C - VERTICAL DEPTH OF CONCRETE
BEARING ON UNDISTURBED EARTH

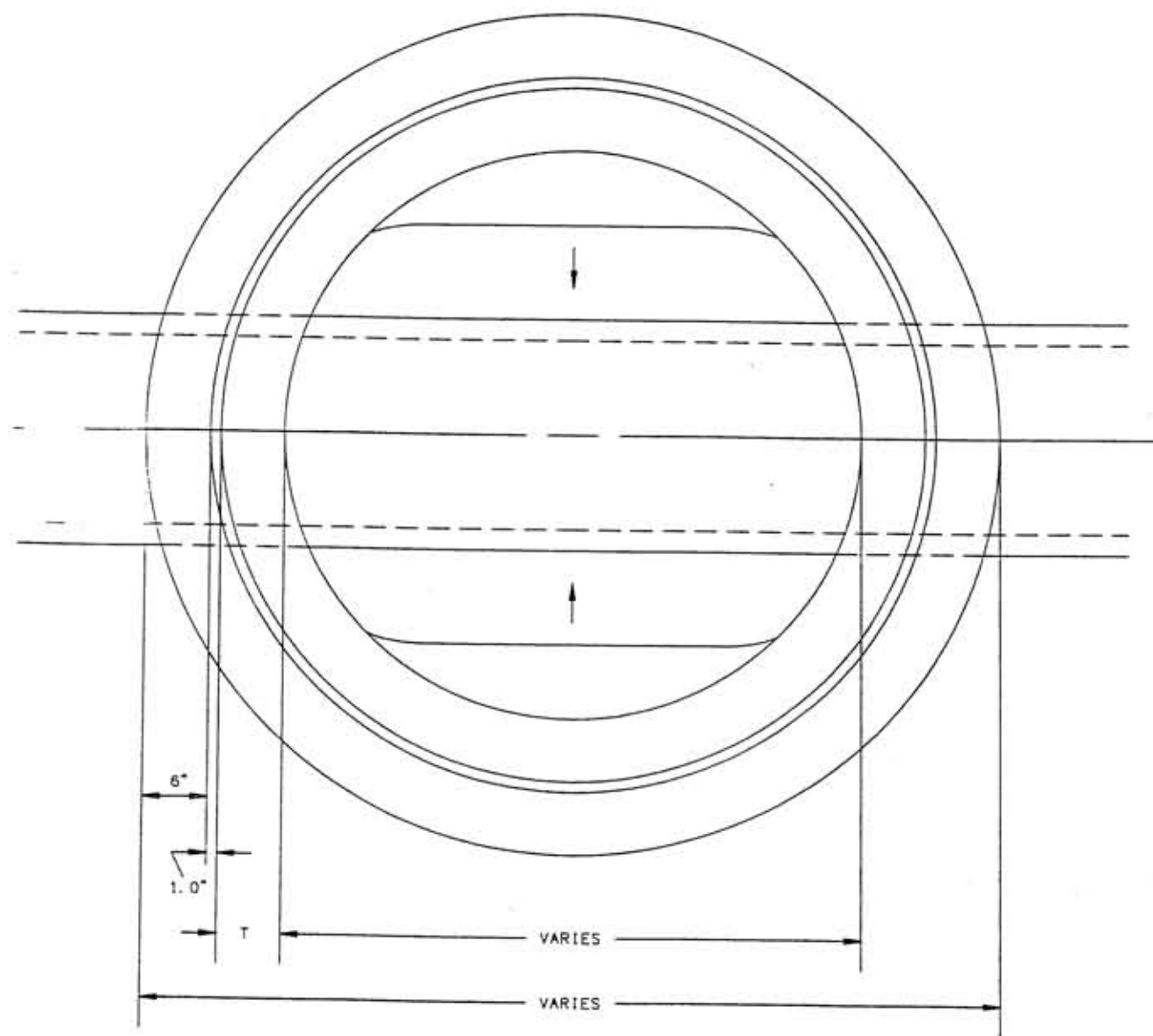
NOTE:

ALL THRUST BLOCKING SHALL BE CLASS
"A" CONCRETE AND SHALL BE PLACED
AGAINST UNDISTURBED EARTH.

FITTINGS SHALL BE POLY WRAPPED
BEFORE BLOCKING IS PLACED

3					<p>CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p> <p>CITY DESIGN & CONSTRUCTION STANDARDS BLOCKING FOR PLUG</p>	INDEX	BLK_1P	SCALE	N.T.S.
2						DRAWN	A.R.Karch/S.B.		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	W-10

PLAN
CAST IN PLACE MANHOLE BASE



STD. MANHOLE SECTION
CAST WITHOUT TONGUE
OR GROOVE AT THE
BOTTOM

GROUT SEAL
6"

SEAL JOINT WITH RAMNEK
OR APPROVED EQUAL

CUT TOP OUT OF PIPE AS NEAR
SPRING LINE AS POSSIBLE
AFTER M.H. HAS BEEN TESTED
AND IS READY TO PLACE IN
SERVICE

1" / FT.
SLOPE

M. H. DIA	T
4'	5"
5'	6"
6'	7"
7'	8"
8'	9"

CONCRETE FOR CAST IN PLACE
MANHOLE BASE SHALL HAVE A
MINIMUM 28 DAY COMPRESSIVE
STRENGTH OF 4000 PSI

PLACE CONCRETE AROUND
EXISTING SEWER IN PLACE

CRUSHED STONE BEDDING
MINIMUM THICKNESS 6"

SECTION

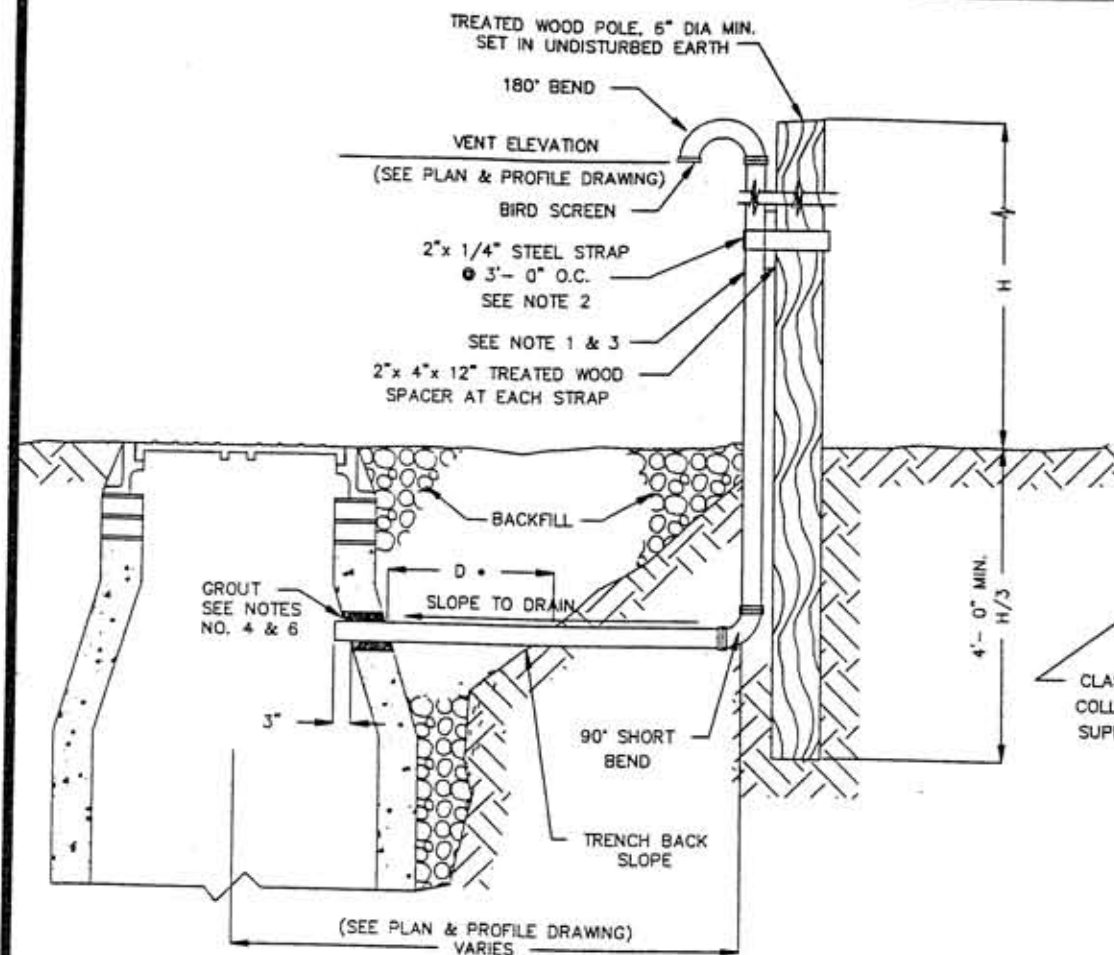
CAST IN PLACE MANHOLE BASE

3			
2			
1			
REV. NO.	DATE	BY	DESCRIPTION



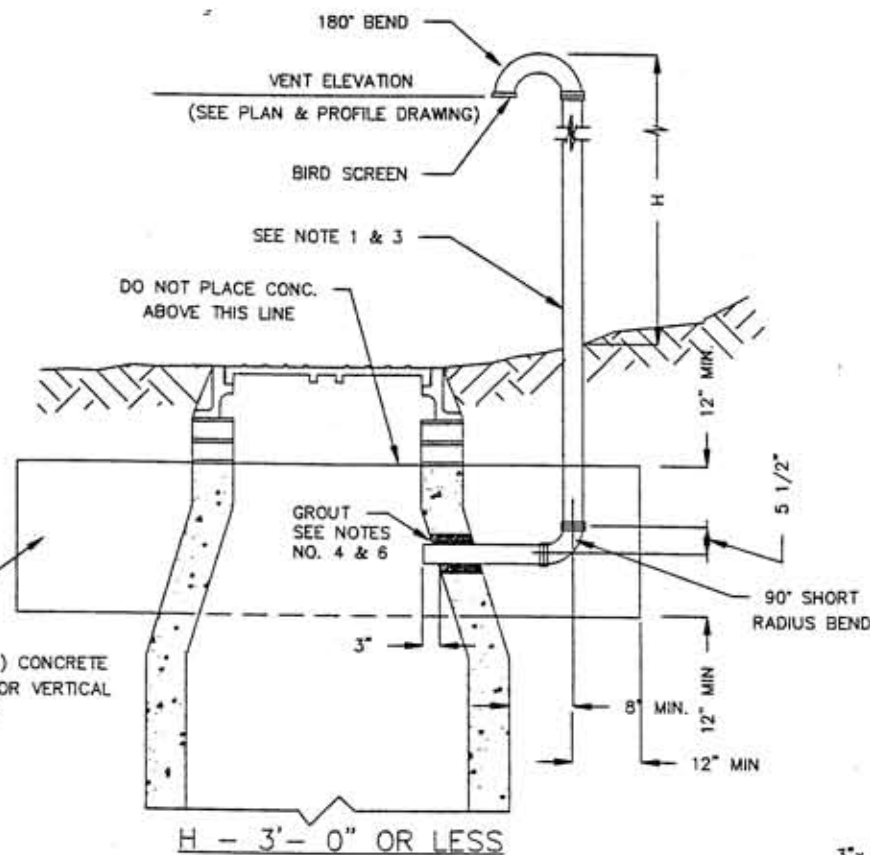
CITY OF MIDLAND
DESIGN AND CONSTRUCTION DIVISION
CITY DESIGN & CONSTRUCTION STANDARDS
MANHOLE BASE CAST IN PLACE

INDEX	MH_BASE	SCALE	N.T.S.
DRAWN	S.B.		
CHECKED	B.R.G.	DATE:	Nov. 1, 1994
APPROVED	J.P.R.	DWG. NO.	S-1

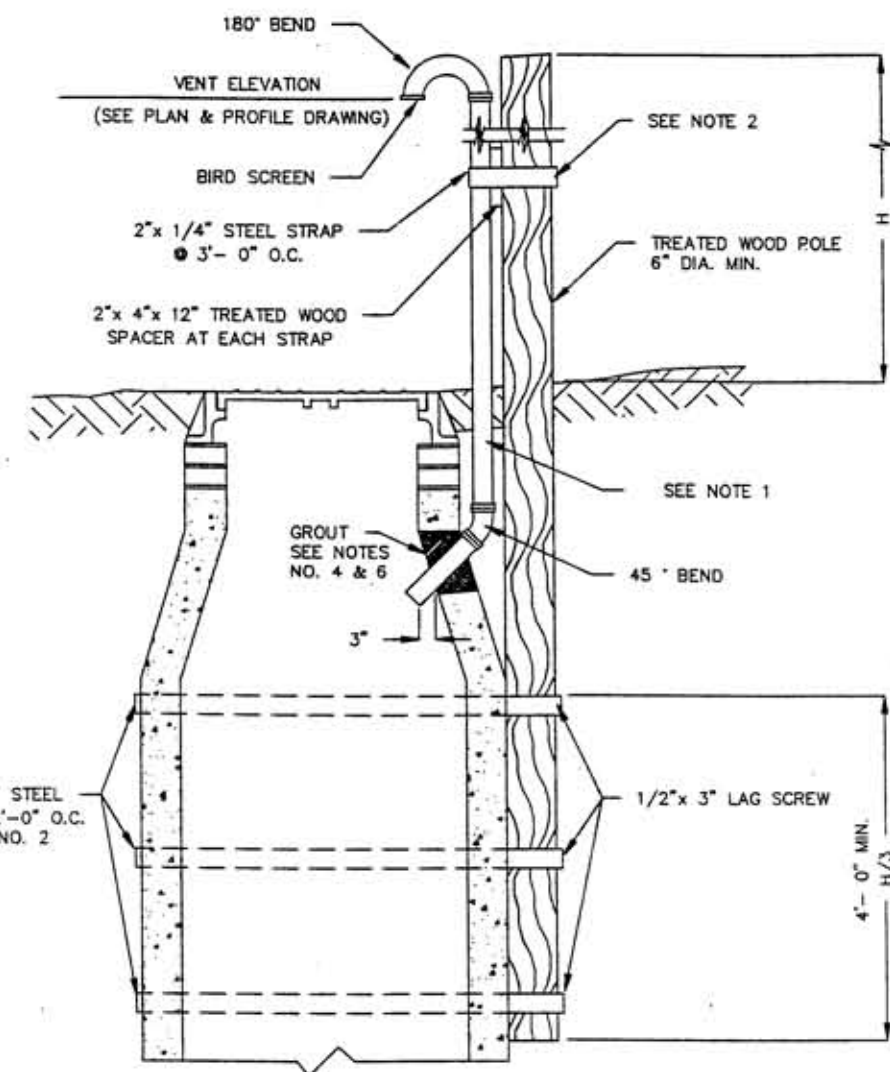


BACKFILL UNDER VENT PIPE WITH PORTLAND CEMENT STABILIZED MATERIAL. CEMENT STABILIZED BACKFILL MATERIAL MUST SUPPORT VENT PIPE FOR THE FULL SPAN D.

REMOTE VENT

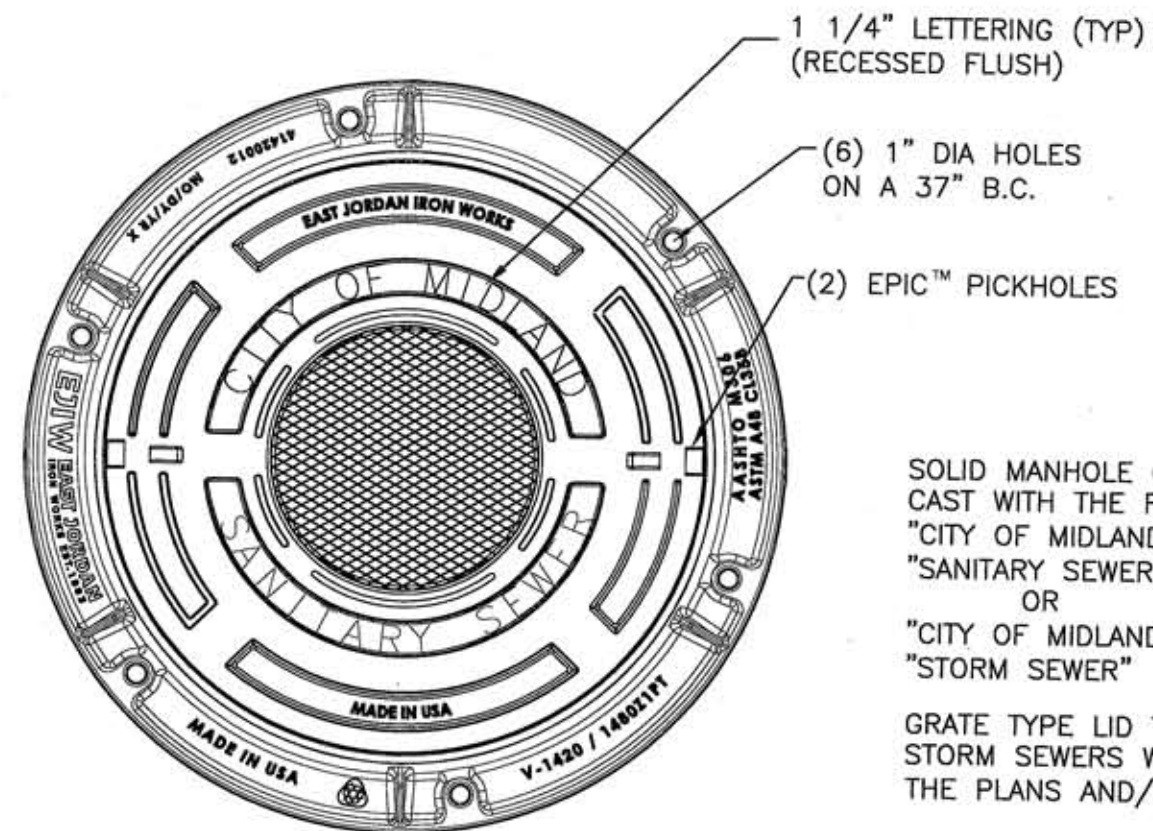
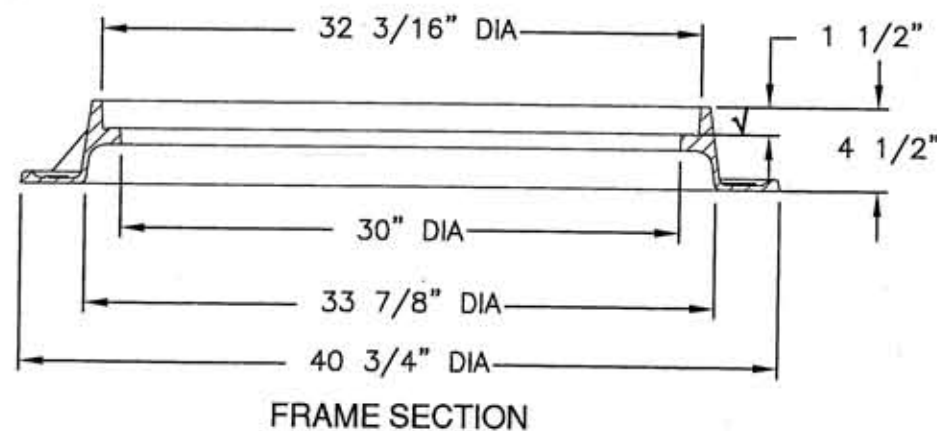
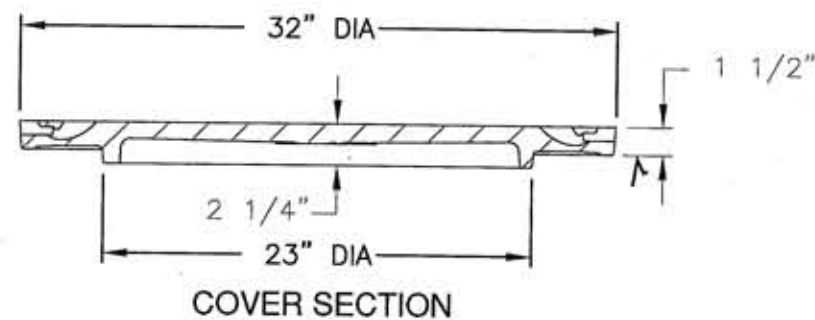


- 1 - ALL PIPING SHALL BE 3" DIA. DUCTILE IRON WITH FLANGED JOINTS COATED INSIDE AND OUTSIDE
- 2 - PAINT ALL STRAPPING WITH 2 COATS OF COAL-TAR EPOXY.
- 3 - PAINT ALL EXPOSED PIPING WITH 2 COAT OF COAL TAR EPOXY.
- 4 - APPROVED WATER TIGHT MANHOLE CONNECTOR INSTALLED PER SPECIFICATIONS AND / OR MANUFACTURE'S INSTRUCTIONS.
- 5 - SEE PLAN AND PROFILE SHEETS FOR MANHOLE INVERT DETAILS.
- 6 - GROUT SHALL BE APPROVED NON-SHRINK TYPE
- 7 - MANHOLE VENT TO BE USED IN CONJUNCTION WITH WATER TIGHT MANHOLE RINGS & COVERS SPACED EVERY THIRD MANHOLE OR AS SHOWN ON THE PLANS.



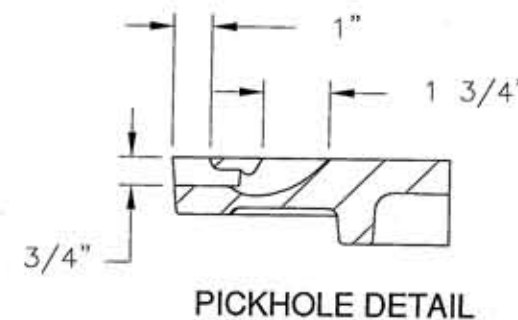
H - OVER 3'-0"

3					<p>CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p> <p>CITY DESIGN & CONSTRUCTION STANDARDS MANHOLE VENT</p>	INDEX	MH_VENT	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	S-2




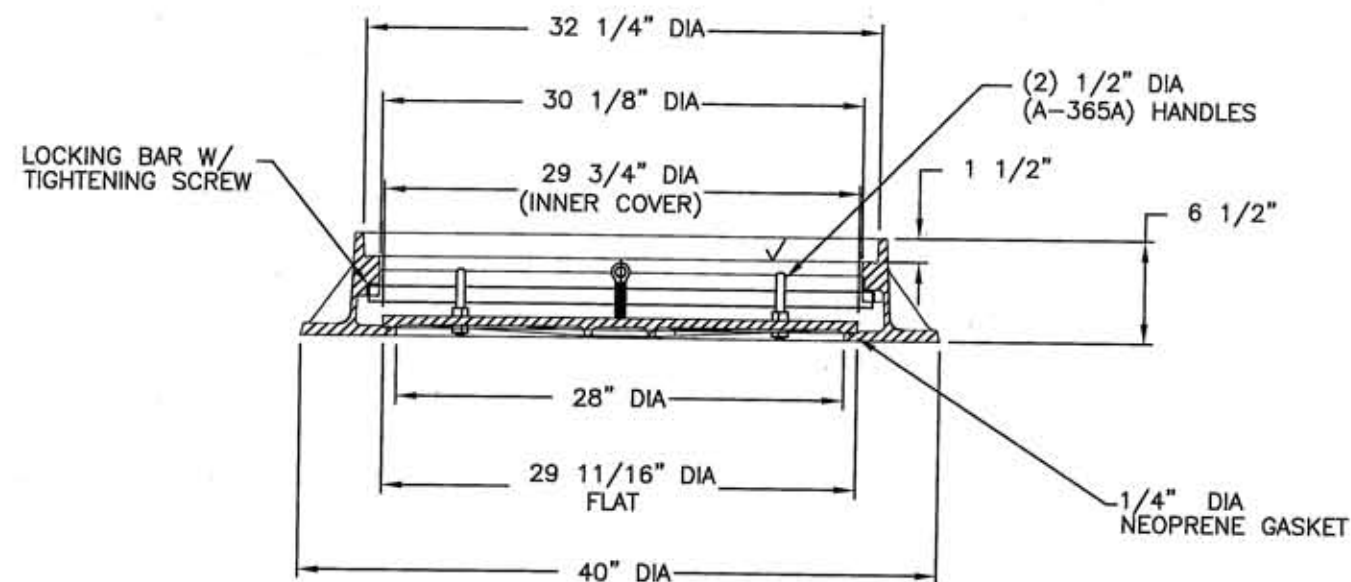
SOLID MANHOLE COVERS SHALL BE
CAST WITH THE FOLLOWING:
"CITY OF MIDLAND"
"SANITARY SEWER"
OR
"CITY OF MIDLAND"
"STORM SEWER"

GRATE TYPE LID TO BE FURNISHED FOR
STORM SEWERS WHEN CALLED FOR ON
THE PLANS AND/OR BID PROPOSAL.

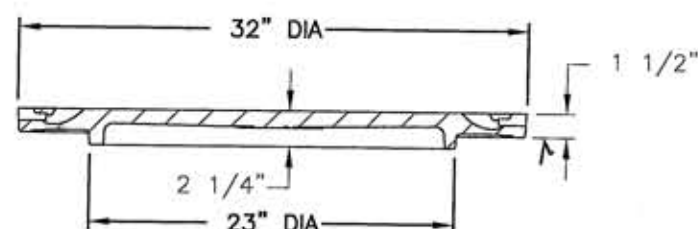


EAST JORDAN IRON WORKS V1420/1480Z1
OR APPROVED EQUAL V1430ADI

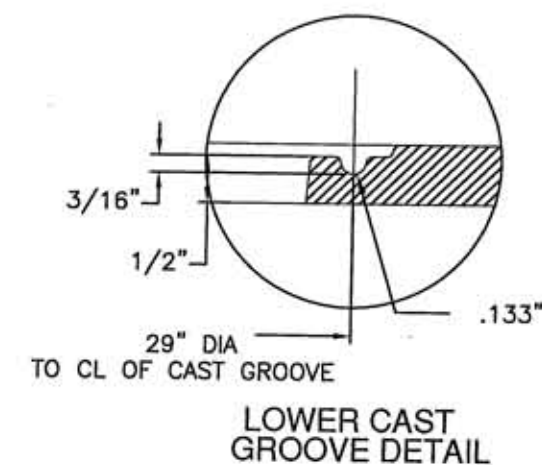
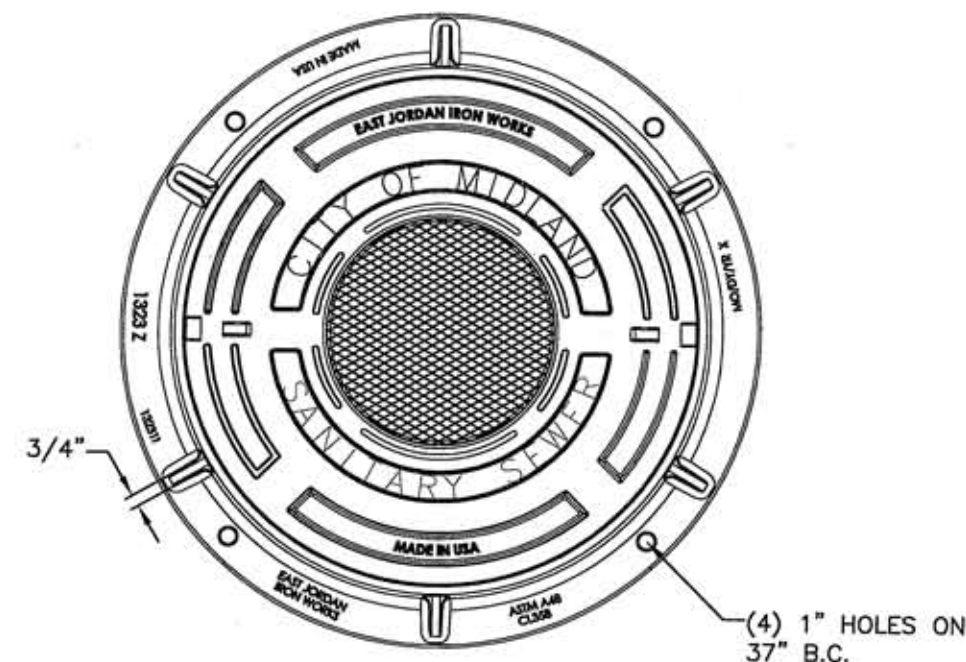
					<p>Engineering Services Division Development Services Department City Design and Construction Standards Sanitary & Storm Sewer Manhole Covers</p>	<p>Dwg. Name mh_r_c_09 Drawn By V.M. Lowe Checked By A.R. KARCH Approved By R. FRANKS</p>	<p>Dwg. No. S-3a Date JANUARY 2009 Scale N.T.S.</p>
Rev. No.	Date	By	Description				



FRAME SECTION




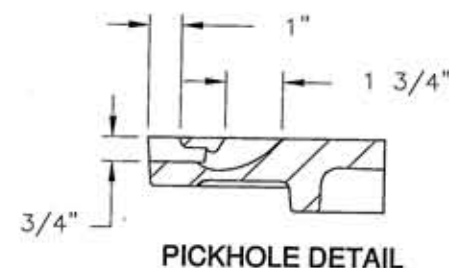
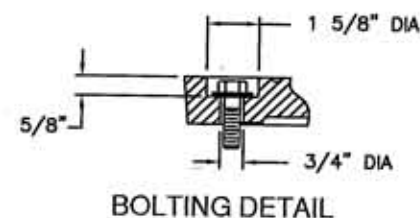
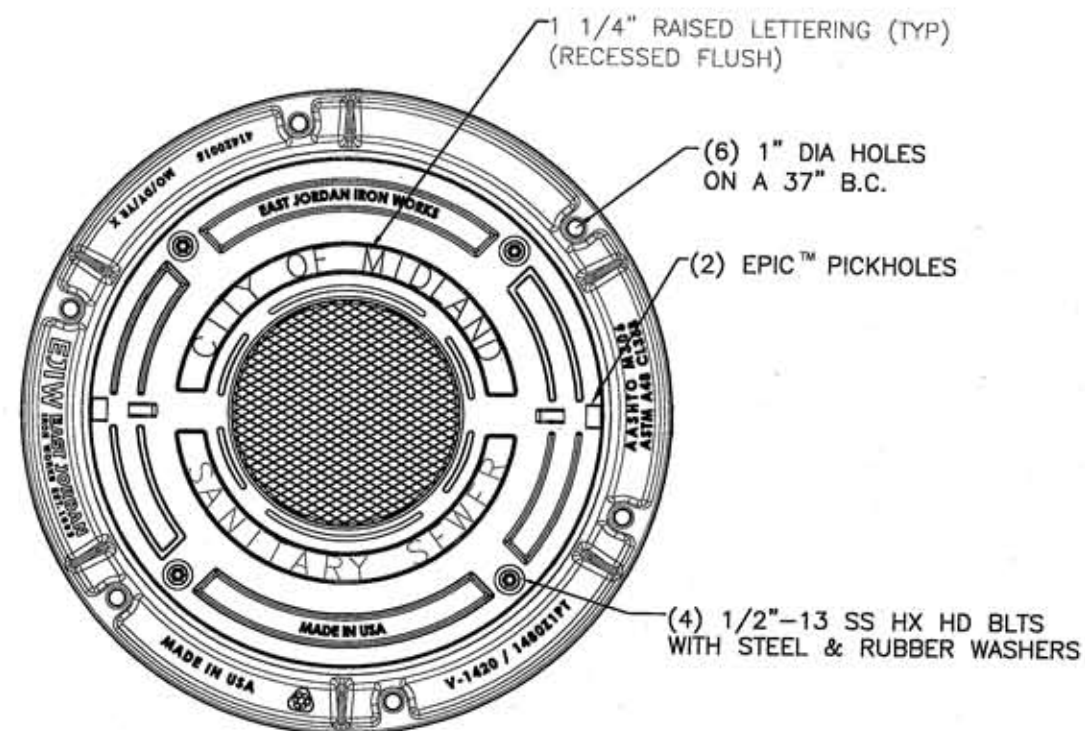
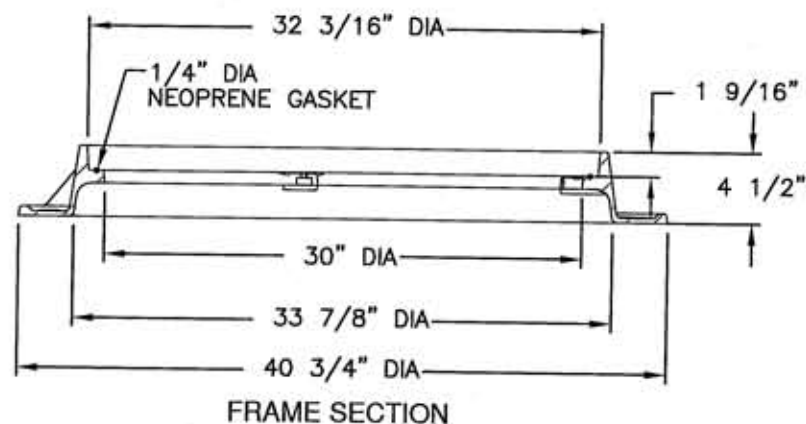
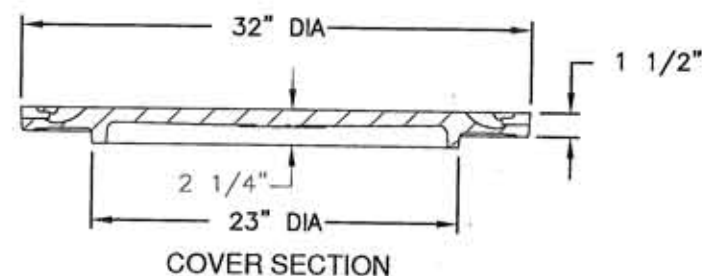
OUTER COVER SECTION



SOLID MANHOLE COVERS SHALL BE CAST WITH THE FOLLOWING:
"CITY OF MIDLAND"
"SANITARY SEWER"
OR
"CITY OF MIDLAND"
"STORM SEWER"


EAST JORDAN IRON WORKS V1430ADI
1323G
1323Z
OR APPROVED EQUAL

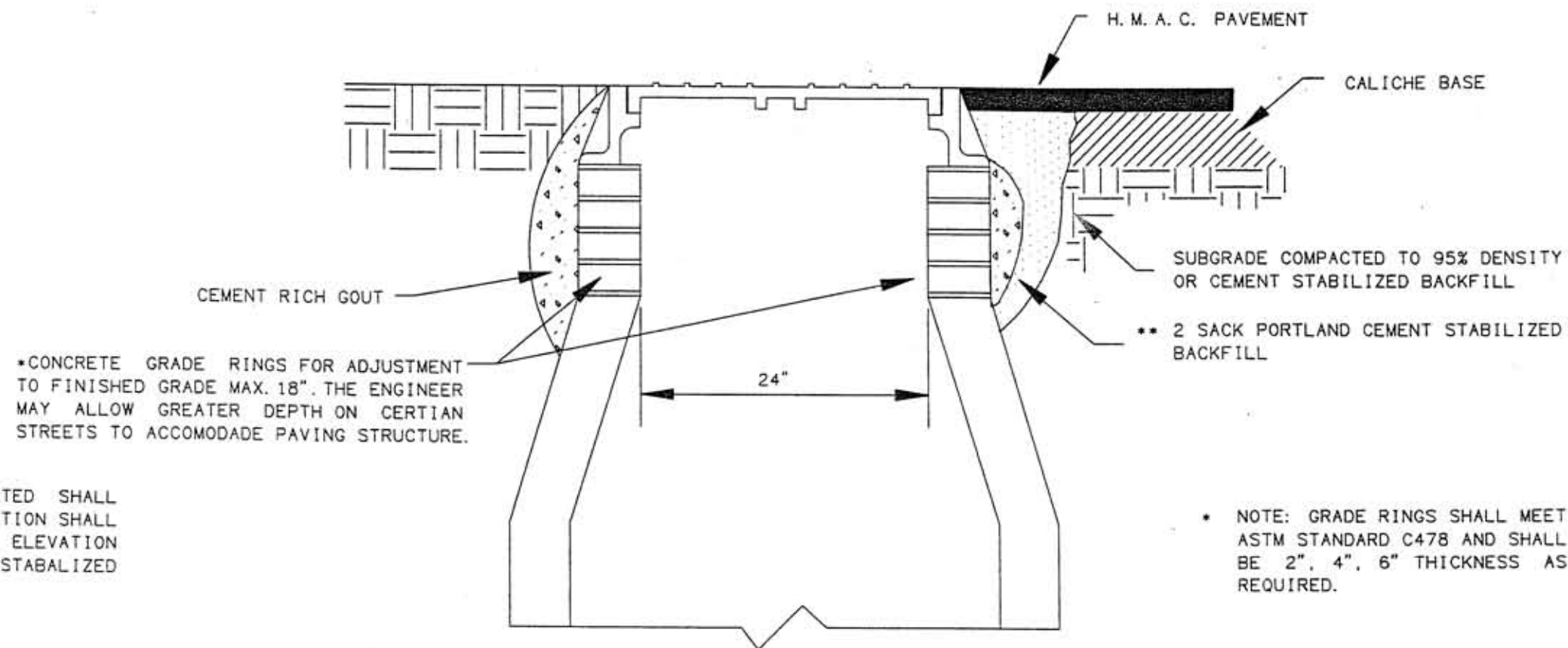
					Engineering Services Division Development Services Department City Design and Construction Standards Sanitary & Storm Sewer Manhole Covers	Dwg. Name mh_r_c_09 Drawn By V.M. LOWE Checked By A.R. KARCH Approved By R. FRANKS	Dwg. No. S-3b Date JANUARY 2009 Scale N.T.S.
Rev. No.	Date	By	Description				



SOLID MANHOLE COVERS SHALL BE
CAST WITH THE FOLLOWING:
"CITY OF MIDLAND"
"SANITARY SEWER"
OR
"CITY OF MIDLAND"
"STORM SEWER"

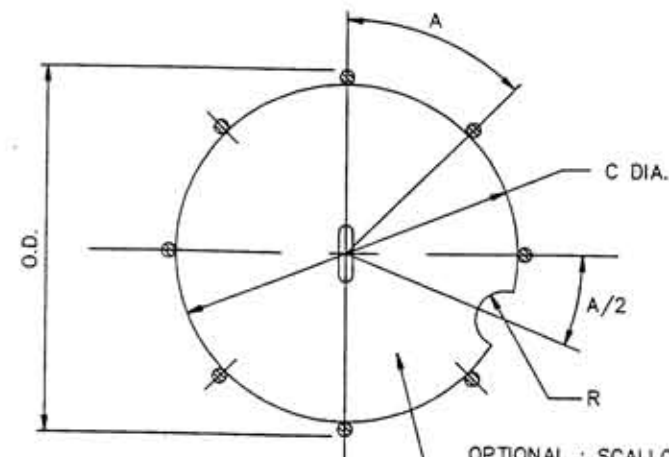
EAST JORDAN IRON WORKS V1420/1480Z1 PT
V1430APT DI
OR APPROVED EQUAL

					Engineering Services Division Development Services Department City Design and Construction Standards Sanitary & Storm Sewer Manhole Covers	Dwg. Name	mh_r_c_09	Dwg. No.	S-3c
						Drawn By	V.M. LOWE		
						Checked By	A.R. KARCH	Date	JANUARY 2009
						Approved By	R. FRANKS	Scale	N.T.S.
Rev. No.	Date	By	Description						



MANHOLE ADJUSTMENT

3					<p>CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p> <p>CITY DESIGN & CONSTRUCTION STANDARDS MANHOLE ADJUSTMENTS</p>	INDEX	MH_ADJ	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	S-5

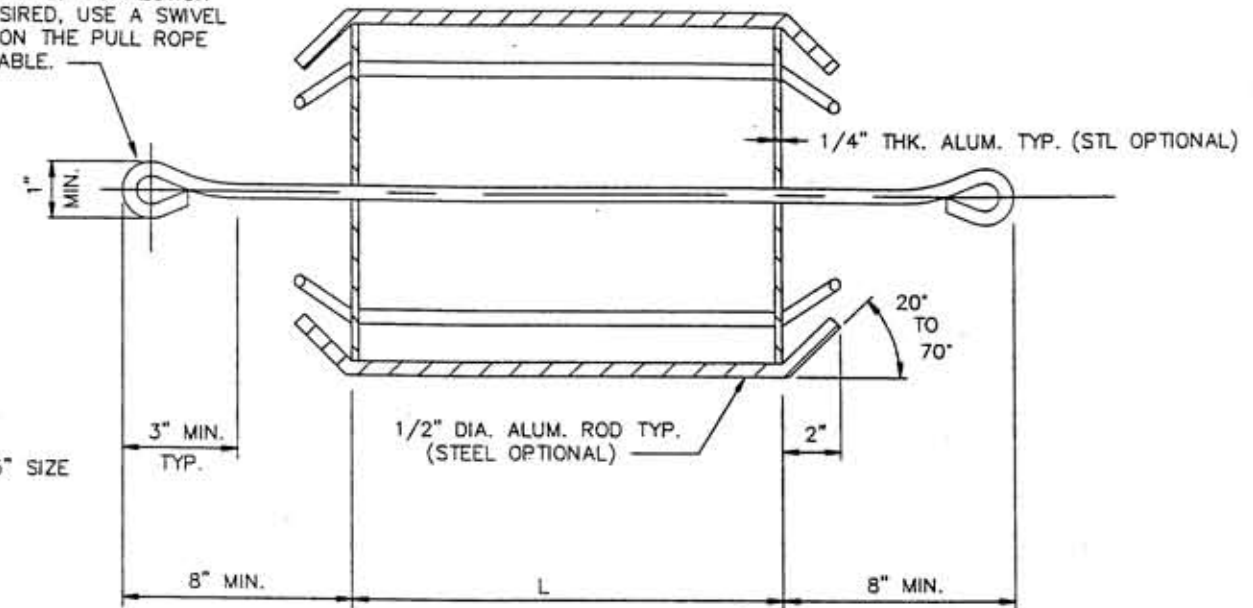


STAMP IDENTIFICATION
ONE END TYP.

OPTIONAL: SCALLOPS
(CENTERED BETWEEN RUNNERS)
RADIUS:
R = 1" FOR 10", 12" & 15" SIZE
R = 3/4" FOR 8" SIZE
R = 1/2" FOR 6" SIZE

NUMBER OF RUNNERS	7	8	9	10	11	12
ANGLE A	51.4°	45°	40°	36°	32.7°	30°

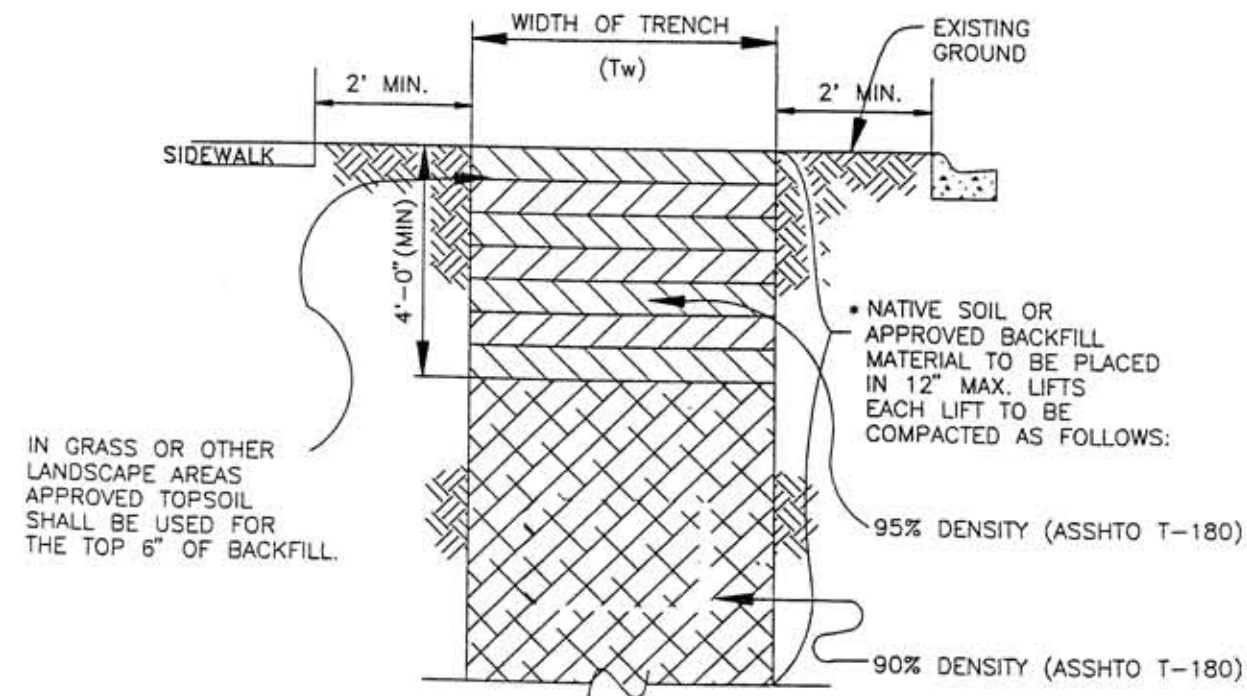
NOTE:
IF A SWIVEL CONNECTION
IS DESIRED, USE A SWIVEL
CLIP ON THE PULL ROPE
OR CABLE.



SDR-26			SDR-35			L		OVERALL LENGTH OF RUNNER MATERIAL REQUIRED = L + 4"	GO/NO-GO MANDREL FOR ASTM D-3034 SDR-26 & SDR-35 GRAVITY SEWER PIPE DEFLECTION TESTING OF INSTALLED SEWER PIPE
STAMPED IDENTIFICATION	O.D.	C	STAMPED IDENTIFICATION	O.D.	C	MIN.	MAX.		
D-3034 SDR-26 15" 5%	12.90	11.90	D-3034 SDR-35 15" 5%	13.20	12.20	4"	TO 15"		
D-3034 SDR-26 12" 5%	10.55	9.55	D-3034 SDR-35 12" 5%	10.79	9.79	3-1/2"	TO 12"		
D-3034 SDR-26 10" 5%	8.87	7.87	D-3034 SDR-35 10" 5%	9.08	8.08	2-3/4"	TO 10"		
D-3034 SDR-26 8" 5%	7.11	6.11	D-3034 SDR-35 8" 5%	7.28	6.28	2-1/4"	TO 8"		
D-3034 SDR-26 6" 5%	5.33	4.33	D-3034 SDR-35 6" 5%	5.45	4.45	1-3/4"	TO 6"	OVERALL LENGTH OF CENTER ROD MATERIAL REQUIRED = L + 26"	
ALL DIMENSIONS IN INCHES		TOLERANCE +0.000 -0.040		TOLERANCE +0.000 -0.040		TOLERANCE		± 1/16"	

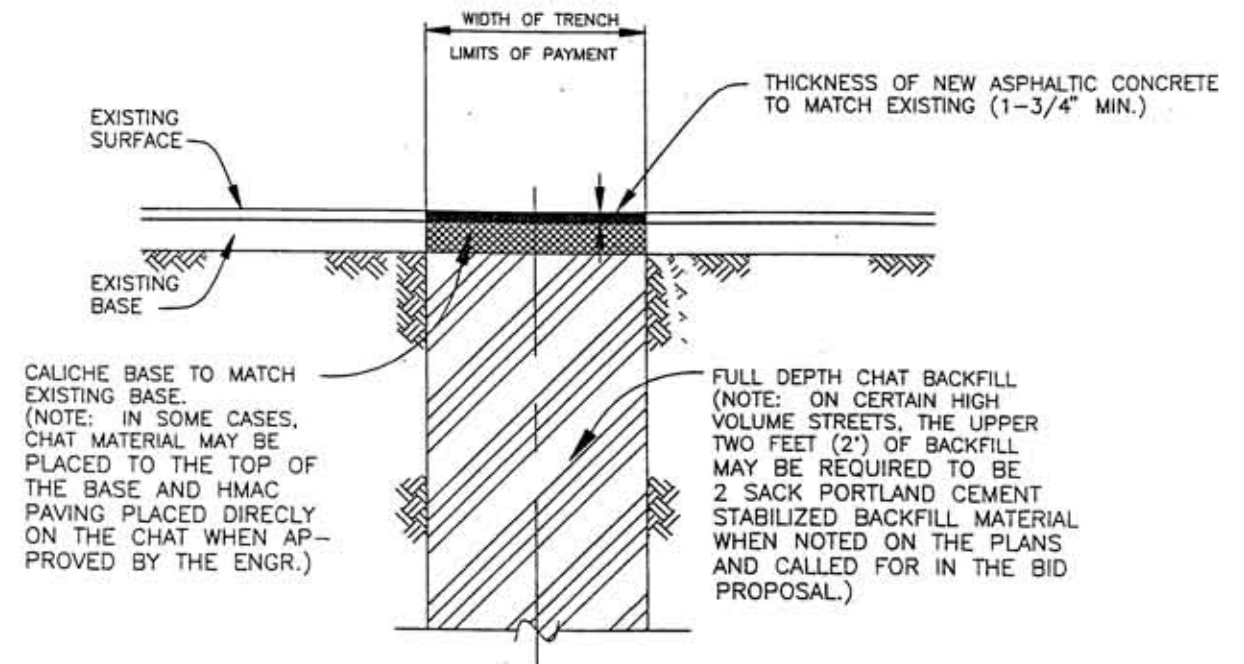
NOTE:
SEWER LINES SHALL NOT BE
DEFLECTION TESTED UNTIL ALL
BACKFILLED HAS BEEN COMPLETED.
IN PLACE, FOR A MINIMUM OF 30 DAYS.

3					CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION CITY DESIGN & CONSTRUCTION STANDARDS MANDREL	INDEX	MANDREL	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	S-6



TRENCH BACKFILL BEHIND CURBS


AND OUTSIDE OF PAVED AREAS
IN PUBLIC RIGHTS OF WAY



TRENCH BACKFILL & PAVEMENT REPLACEMENT

FOR STREETS AND ALLEYS

- CHAT OR OTHER APPROVED GRANULAR BACKFILL MATERIAL SHALL BE USED WHEN AREA BEHIND CURB IS PAVED, OR WHEN THE EDGE OF THE TRENCH IS LESS THAN 2' FROM THE BACK OF CURB OR EDGE OF SIDEWALK.

3					<p>CITY OF MIDLAND</p> <p>DESIGN AND CONSTRUCTION DIVISION</p>	INDEX	TRCH_BF	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION		CITY DESIGN & CONSTRUCTION STANDARDS TRENCH BACKFILL	APPROVED	J.P.R.	DWG. NO.	S-7

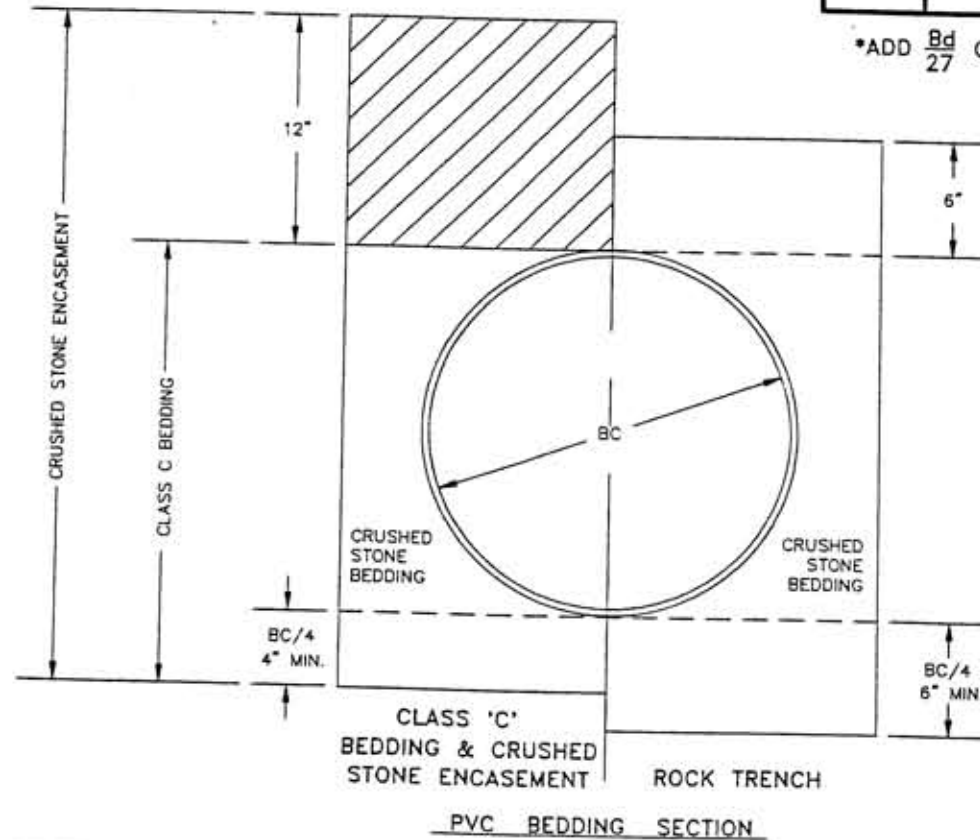
BEDDING FOR ASTM D3034 & ASTM F679

PVC PIPE SEWER

CRUSHED STONE BEDDING MATERIAL ⑤	FOUNDATION	BEDDING	ENCASEMENT	BACKFILL
ASTM C33 GRADE NO. 57	X			
ASTM C33 GRADE NO. 67	X			
ASTM C33 GRADE NO. 8		X	X	
THD 1982 ITEM 302 TYPE 'D' GRADE NO. 4		X	X	
THD 1982 ITEM 302 TYPE 'D' GRADE NO. 5		X	X	
CRUSHER FINES ⑥				X



	PIPE DIAMETER	TRENCH WIDTH Bd.	TRENCH VOLUME	CRUSHED STONE BEDDING	
				① CLASS *C	② *ROCKTRENCH
	In.	Ft.	Cy./FT./Ft.	Cy./Ft.	Cy./Ft.
ASTM D3034	4	2.00	.074	.047	.057
	6	2.00	.074	.055	.048
	8	2.33	.086	.075	.056
	10	2.33	.086	.082	.056
	12	2.50	.093	.096	.062
	15	2.67	0.99	.112	.065
ASTM F679	18	3.00	.111	.146	.066
	21	3.33	.123	.185	.065
	24	3.50	.130	.211	.061
	27	4.00	.148	.274	.069

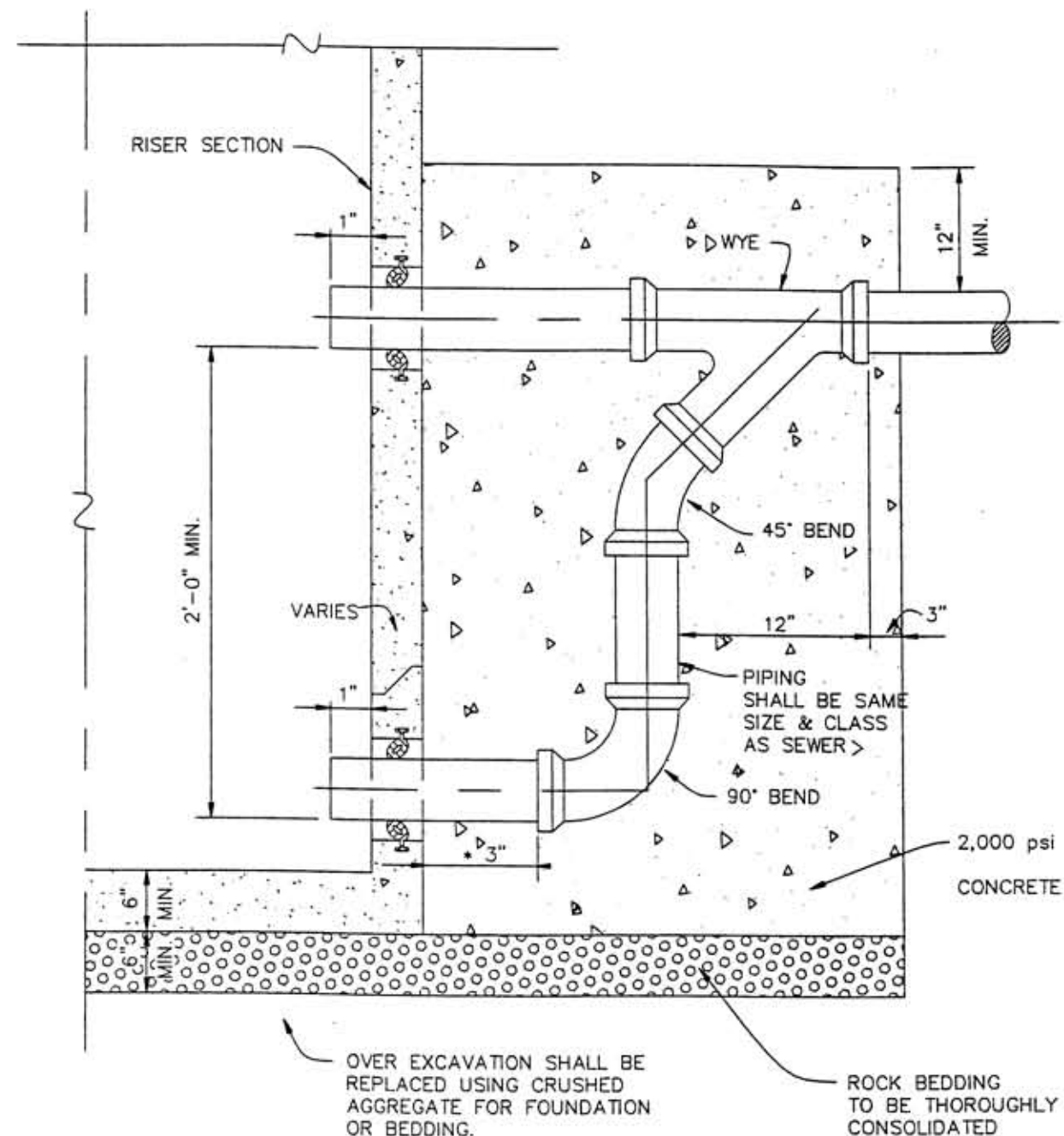
*ADD $\frac{Bd}{27}$ C.Y./L.F. FOR CRUSHED STONE ENCASEMENT



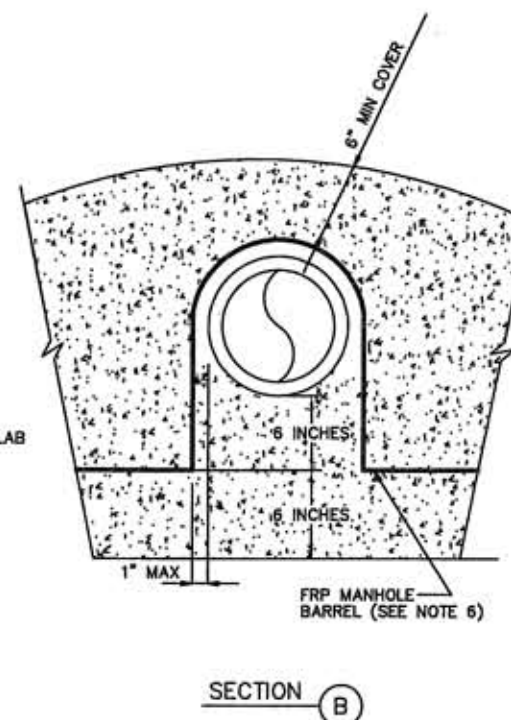
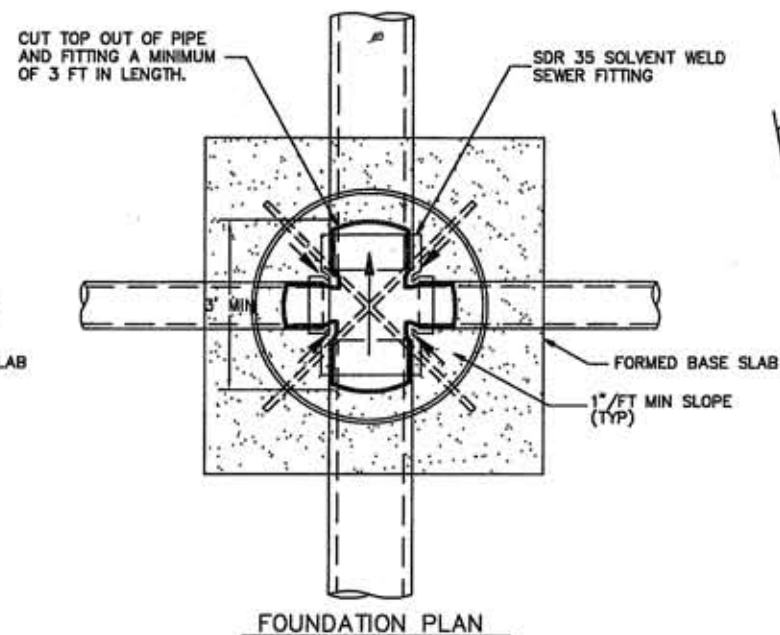
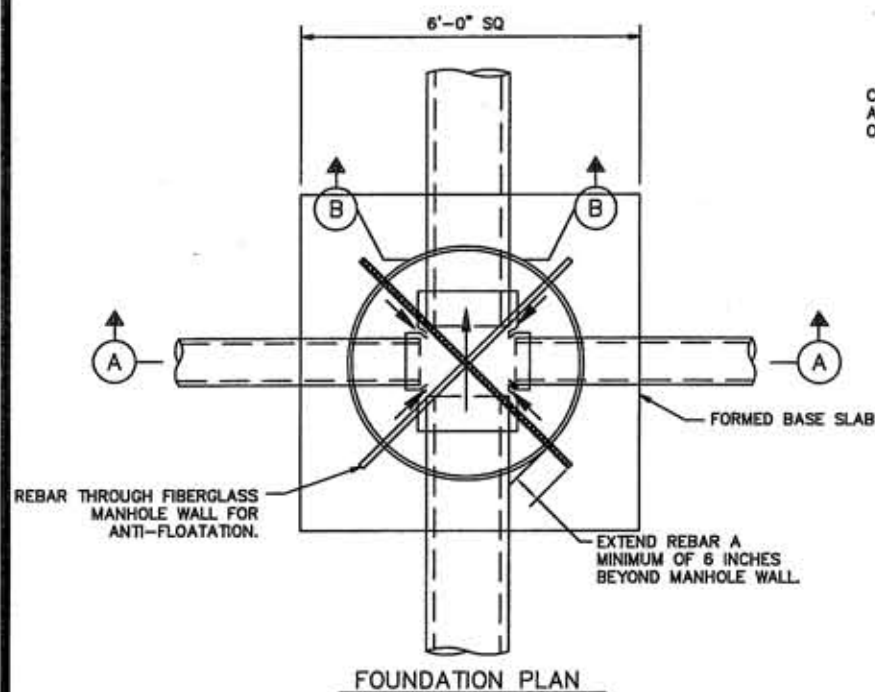
- ① The minimum bedding for sanitary sewer is class 'C'. No separate payment will be made for class 'C' bedding but the cost of same shall be included in the price bid per linear foot of the various sizes of sewer pipe installed.
- ② Quantities shown for the various classes of crushed stone bedding are the amounts in excess of that required for class 'C' bedding. To determine the total material required, add the quantity shown in the applicable column to the quantity shown under 'C' bedding.
- ③ Bd. = Max. trench width 12" above top of pipe.
- ④ Bedding shown is good for up to 30' cover with maximum long term deflection of 7 1/2%.
- ⑤ Crushed stone material proposed for use on this project and not meeting the above specification must be approved in writing at least (48) hours prior to the time scheduled for opening bids.
- ⑥ Approximate gradation for crusher fines

sieve size	% PASSING
2"	100
NO. 4	35-100
NO. 10	20-100
NO. 40	3-35
NO. 200	4-10

3					<p>CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION</p>	INDEX	S_S_BED	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION		<p>CITY DESIGN & CONSTRUCTION STANDARDS SANITARY SEWER BEDDING</p>	APPROVED	J.P.R.	DWG. NO.	S-8

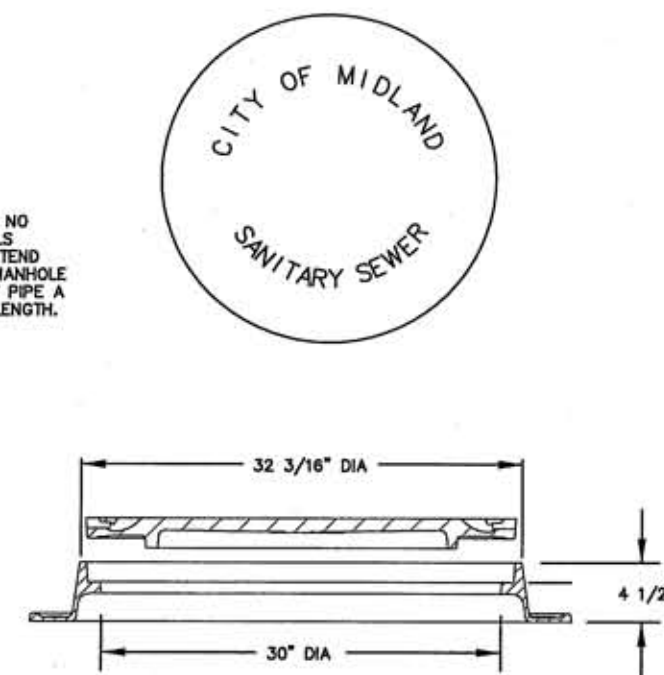
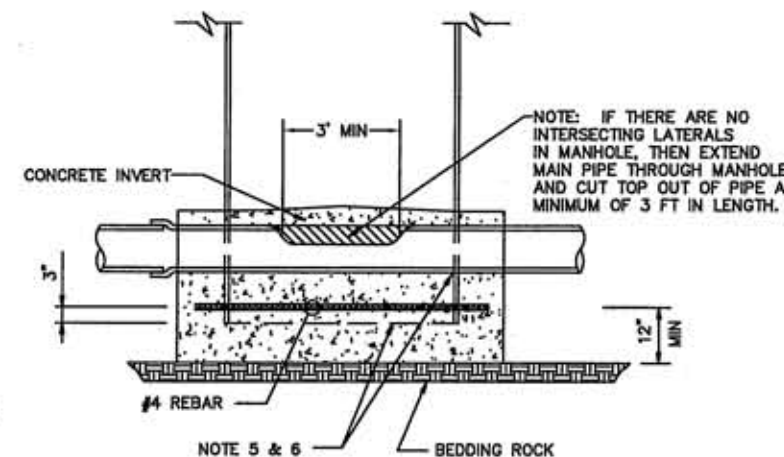
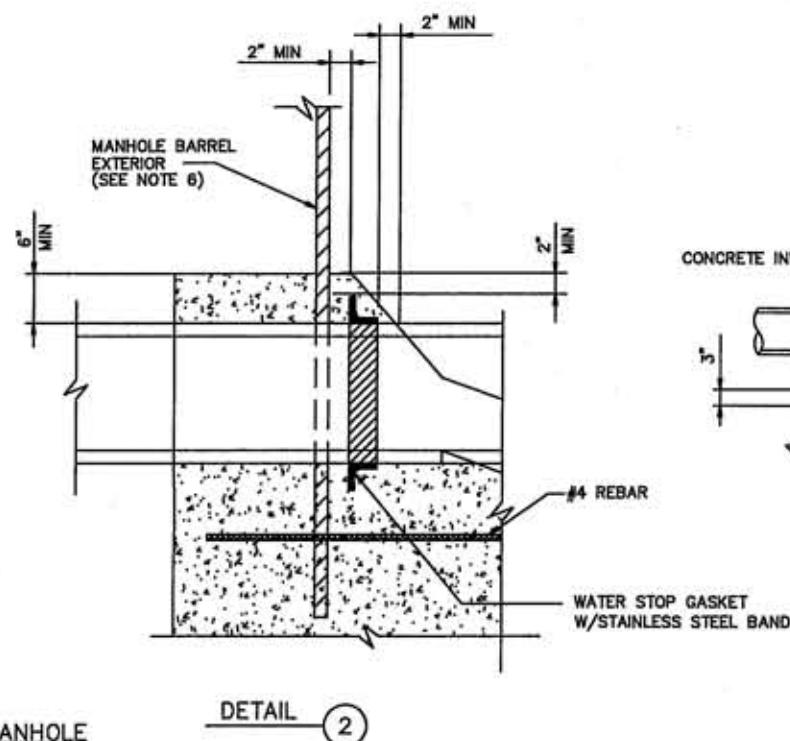
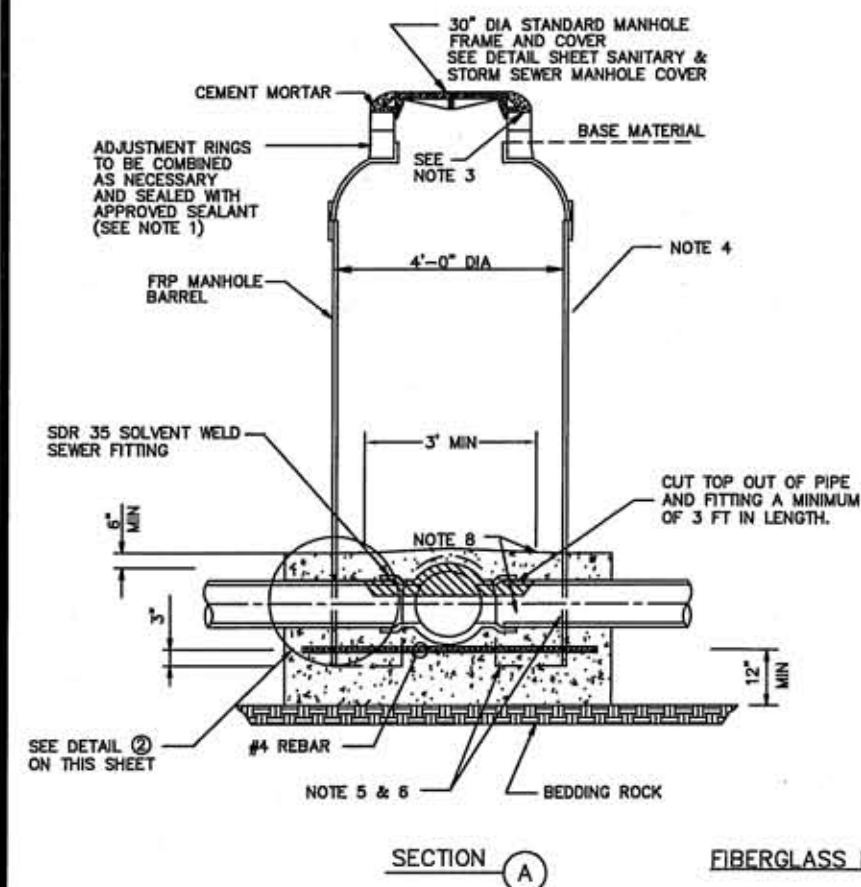


3					CITY OF MIDLAND DESIGN AND CONSTRUCTION DIVISION CITY DESIGN & CONSTRUCTION STANDARDS DROP MANHOLE	INDEX	DROP_MH	SCALE	N.T.S.
2						DRAWN	A.R.Karch		
1						CHECKED	B.R.G.	DATE:	Nov. 1, 1994
REV. NO.	DATE	BY	DESCRIPTION			APPROVED	J.P.R.	DWG. NO.	S-9



NOTES:

- POLYETHYLENE RINGS SHALL BE PROVIDED FOR A COMBINED ADJUSTMENT HEIGHT OF AT LEAST 4". THE TOTAL HEIGHT OF THE ADJUSTMENT RINGS SHALL NOT EXCEED 12", UNLESS NEEDED TO KEEP FRP SECTION BELOW BASE WATERLID.
- DROPS AND INTERSECTING PIPES SHALL BE INSTALLED ONLY WHEN CALLED FOR IN PLAN AND PROFILE DRAWINGS.
- SEAT MANHOLE FRAME IN SEALANT PER COM STANDARD SPECIFICATION.
- MANUFACTURED WATERTIGHT CONNECTOR, CORE DRILL AND INSTALL PER MANUFACTURERS RECOMMENDATIONS.
- MAKE CUTOUT FOR PIPE PENETRATION TO FOLLOW CURVATURE OF THE PIPE AND WITH A MAXIMUM OF 1" CLEARANCE.
- PIPE PENETRATION CUTOUT MAY EXTEND TO THE BARREL BOTTOM (AS SHOWN IN SECTION B) OR BE A CONCENTRIC HOLE, AS SHOWN IN DETAIL 2. RESIN.
- GRATE TYPE LID TO BE FURNISHED FOR STORM SEWERS WHEN CALLED FOR ON THE PLANS AND/OR BID PROPOSAL. SEE DETAIL SHEET SANITARY & STORM SEWER MANHOLE COVER. EAST JORDAN IRON WORKS RING AND COVER V1420/1480Z1, V1430ADI OR APPROVED EQUAL.
- FORM FLOW SURFACE AND MOUND CONCRETE AROUND PIPE PENETRATIONS, TO FORM A SEAL, IN ONE CONTINUOUS PLACEMENT OPERATION.
- LOCK RING & COVER USE EAST JORDAN IRON WORKS V/1430ADI/1323G/1323Z OR APPROVED EQUAL. SEE DETAIL SHEET 5-3b.
- WATER TIGHT RING & COVER USE EAST JORDAN IRON WORKS V/1420/1480Z1 PT V1430 APT DI OR APPROVED EQUAL. SEE DETAIL SHEET 5-3c.



EAST JORDAN IRON WORKS V1420/1480Z1/V1430ADI OR APPROVED EQUAL DETAIL 5-3a

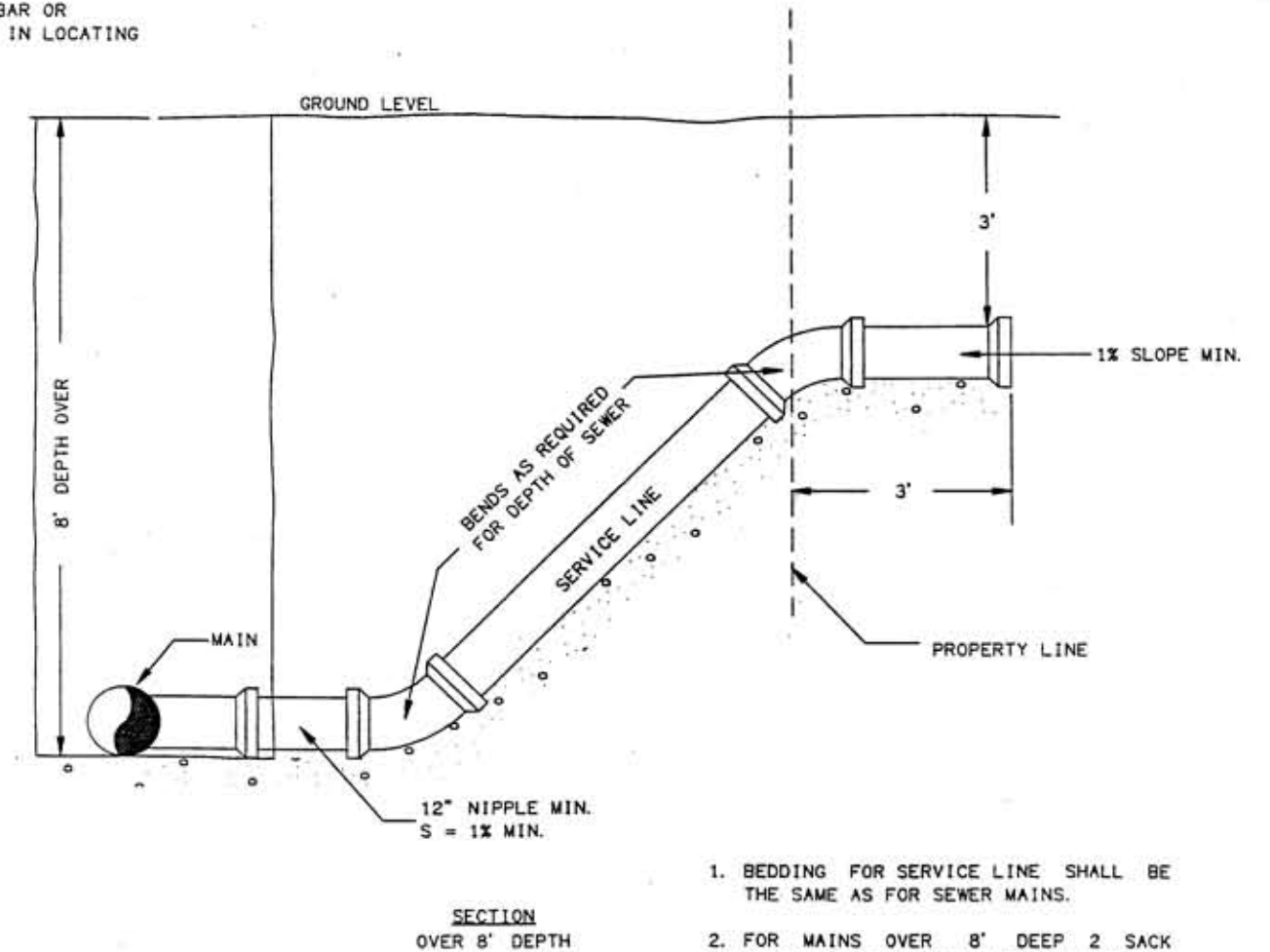
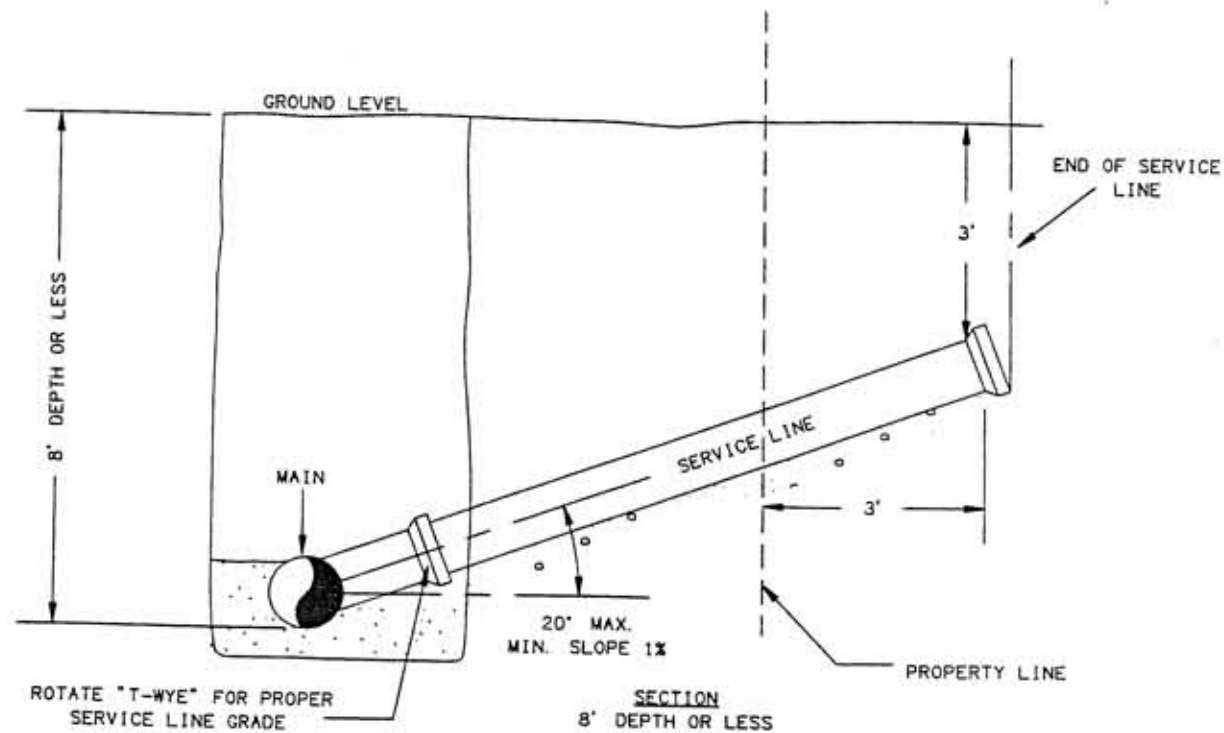
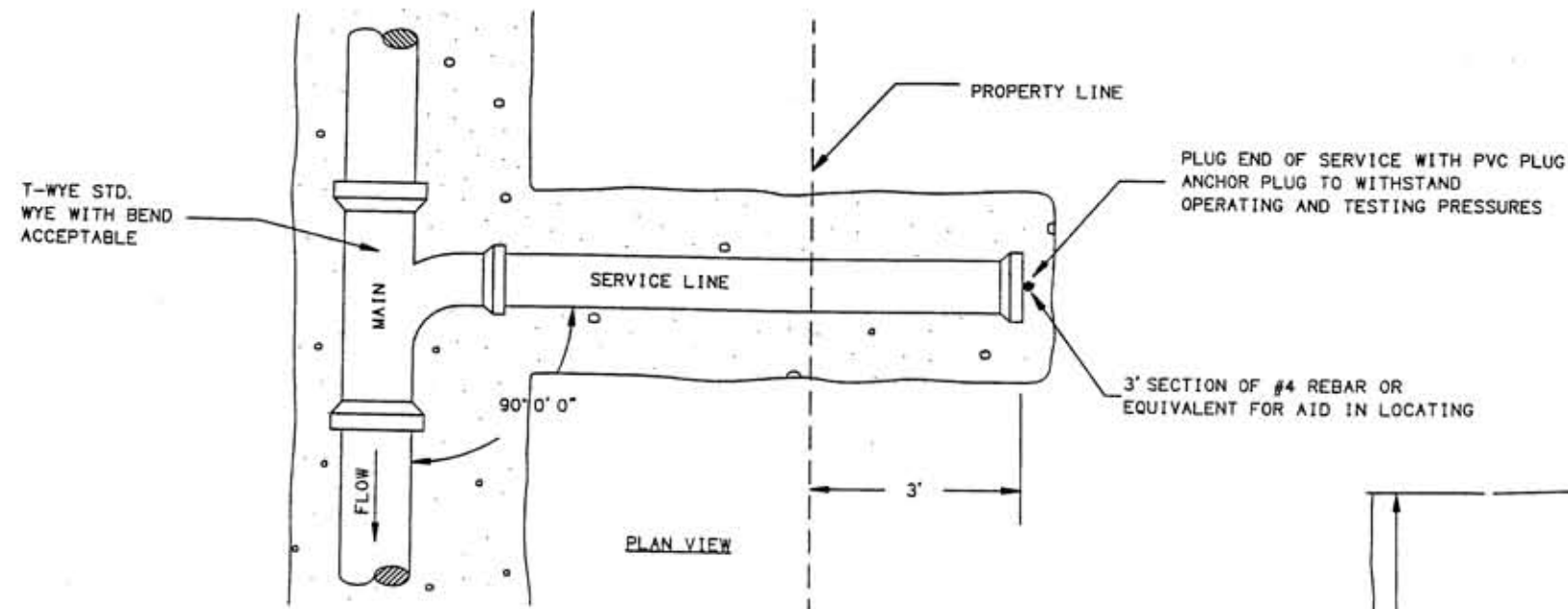


Rev. No.	Date	By	Description
1	6/16/09	VML	CLARIFY NOTES



Engineering Services Division
Development Services Department
City Design and Construction Standards
Sanitary Sewer Manhole

Dwg. Name	mh_fib_09	Dwg. No.	S-10
Drawn By	V.M. LOWE	Date	JANUARY 2009
Checked By	A.R. KARCH	Scale	N.T.S.
Approved By	R. FRANKS		



1. BEDDING FOR SERVICE LINE SHALL BE THE SAME AS FOR SEWER MAINS.
2. FOR MAINS OVER 8' DEEP 2 SACK STABILIZED BACK FILL MAY BE REQUIRED TO ANCHOR SERVICE LINE IN EXTREME CASES.

3			
2			
1			
REV. NO.	DATE	BY	DESCRIPTION



CITY OF MIDLAND
DESIGN AND CONSTRUCTION DIVISION
CITY DESIGN & CONSTRUCTION STANDARDS
SANITARY SEWER SERVICE LINE

INDEX	S_S_SERV	SCALE	N.T.S.
DRAWN	STEVE BAKER		
CHECKED	B.R.G.	DATE:	FEB., 1994
APPROVED	J.P.R.	DWG. NO.	S-11